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COMBUSTION AND HEAT TRANSFER VOLUME 4: COMBUSTION DATA SETS



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PREFACE

The University of Dayton Research Institute (UDRI), working under Air Force Contract No. F33615-92-C-2207 submitted this final report to the U.S. Air Force Wright Laboratory, Aero Propulsion and Power Directorate, Wright-Patterson AFB, OH. Mr. Charles Frayne of WL/POSC (now AFRL/PRSC) was the Contract Monitor and Dr. D. R. Ballal of the Aerospace Mechanics Division, UDRI was the Principal Investigator. This report covers work performed during the period June 8, 1992 through December 31, 1997.

The Principal Investigator wishes to express his gratitude and appreciation to Dr. W. M. Roquemore for his encouragement and support and to Ms. Linda Nianouris for her assistance in report preparation.

1.0 INTRODUCTION

A long-term goal of the Air Force is to develop high-performance gas turbine engines with combustors that operate at near-stoichiometric conditions, burn broad-specification fuels, and have low maintenance and high durability. Therefore, the objective of the proposed research was to develop a fundamental understanding of the combustion process in a gas turbine combustor by designing a variety of laboratory experiments. Specifically, we completed the following key investigations.

- 1. WSR experiments to study combustion stability, lean blowout (LBO), and emissions.
- 2. Flame stabilization and lean blowout studies using a step swirl combustor (SSC).
- 3. Study of turbulent swirling jet diffusion flame structure and stability.

In this final report, we present the Combustion Data Sets that may be used by modelers in the industry and other laboratories for evaluating and refining computer models of gas turbine combustor. Only a sample of these data sets is presented. An exhaustive amount of information is available in the individual papers and data set reports listed in the next section. All the data sets were prepared using Microsoft Office 97 Software for IBM PC-Compatible computers. These data sets are also available on computer floppy diskettes, CDs, and by accessing the World Wide Web (WWW).

These data sets were obtained in the Fundamental Combustion Laboratory located in Building 490, Test Cells 151,152, and 153 of the Fuels and Lubrication Division (WL/POSF). This test facility is equipped with a toroidal well stirred reactor (WSR), an SSC, and a swirling jet diffusion flame combustor. A brief description of the test facility and test conditions is given. Next, selected (and sample) data sets are presented on WSR experiments, SSC tests, and turbulent swirling flame measurements. An analysis, discussion, and interpretation of these data and results are presented in a separate "combustion studies" report.

2.0 DESCRIPTION OF TEST FACILITY

2.1 Well Stirred Reactor (WSR) Experiments

2.1.1 Test Facility and Instrumentation

Figure 1 shows a 250-ml toroidal WSR that was used for this experiment. This reactor was constructed of alumna cement, and featured a jet ring with 32 stainless steel jets, 1 mm I.D., to inject the fuel-air mixture at high subsonic velocity (Ma = 0.42 to 0.85). Figure 2 provides a schematic of the test facility and instrumentation.

The Horiba Emissions Analyzers comprised the following units: Model MPA-510 oxygen analyzer (0 to 50 volume percent), Model FIA-510 total hydrocarbon analyzer (0 to 10,000 ppm carbon), Model VIA-510 CO (0 to 20 volume percent) and CO_2 (0 to 100 volume percent) analyzer, and Model CLA-510 SS NO and NO_X analyzer (0 to 2000 ppmV). These units were calibrated with gases of the following concentrations: hydrocarbon = 404 ppmV propane, NO = 92 ppmV, $NO_2 = 1.6$ ppmV, CO = 0.4 volume percent, $O_2 = 4.03$ or 5.02 volume percent and $CO_2 = 11.06$ volume percent. Water was scrubbed from the sample gas to a maximum dew point of 5C. All emissions are quoted on dry standard air basis.

A gas sample was drawn from the WSR by a water-cooled stainless steel probe. Hydrocarbon speciation at LBO conditions was performed by collecting sample gas in a Tedlar bag and directly injecting sample into a gas chromatograph-flame ionization detector (GC-FID, Hewlett-Packard HP 5890 A). Combustion temperature, T_f, was measured by insertion of a Type B thermocouple (platinum-6% rhodium, platinum-30% rhodium) coated with alumna ceramic. Temperature measurements were corrected for heat loss by conduction and radiation to colder reactor walls, and heat gain by convection and catalysis. A vaporizer was built to prevaporize liquid fuels, mix the vaporized fuel with air, and then supply this combustible mixture to the WSR.

2.1.2 Test Conditions

Our test matrix is shown in Table 1. The WSR operated over the range of equivalence ratios $\phi = 0.43$ to 0.88, loading parameter (LP) ~ 1.3 g-mol/sec L atm^{1.75}, residence times $\tau \sim 5$ to 8 msec and reactor temperatures $T_f = 1350$ to 2000 K. Hydrocarbons tested were: methane, ethane, cyclohexane, n-heptane, n-dodecane, toluene, ethylbenzene and a gaseous mix of 15 percent methane, 25 percent ethane, 60 percent ethylene by volume (a cracked fuel simulant).

Emissions measurements were performed for all test conditions shown. A volumetric mix of 13 percent C_{14} , 22 percent $C_{2}H_{6}$, 52 percent $C_{2}H_{4}$, 13 percent $C_{7}H_{8}$ by volume, giving a carbon number, CN = 2.52 and carbon to hydrogen mole ratio, (C/H) = 0.5081 was selected as simulant for heavy, aromatic-containing fuels that are cracked using thermal or catalytic processes into light fractions with residual light aromatics. Additionally, several of the leanest conditions shown represented LBO, at which point bag sample emissions data were collected.

2.1.3 Error Analysis

Gaseous fuel flow was monitored to within ± 2 percent of reading using a Gilmont rotameter. Airflow was monitored to within ± 2 percent of full scale using a Brooks rotameter. The combined error produced an uncertainty of ± 3.5 percent in ϕ during combustion of methane in air. Nozzle air was monitored to within ± 2 percent of full scale using a Gilmont rotameter. Liquid hydrocarbons were controlled to within ± 0.3 g/min by the liquid fuel delivery system. The

combined error produced an uncertainty of ± 3.5 percent in ϕ during combustion of a liquid fuel in air. The T_f measurements using the calorimetric method were repeatable at a given ϕ from day-to-day within ± 30 K. Also, calibrated thermocouples agreed with the measurements using the calorimetric method within ± 30 K. The Horiba emissions analyzers have an accuracy within one percent of full scale. This represented an error of 2 ppmV NO_X , 50 ppmV CO, 10 ppmV carbon for UHC, 0.25 volume percent O_2 , and 0.5 volume percent CO_2 . Residence time was typically controllable to within ± 0.6 msec. Additionally, CO measurements were repeatable from day to day within ± 100 ppmV, and NO_X within ± 1.5 ppmV. UHC measurements at very lean conditions suffered from poor repeatability due to variance in the LBO condition. This issue is discussed in detail later. Finally, the sampling system was capable of measuring approximately 90 percent of the CO concentration simulated to be the WSR product concentration at $\phi = 0.6$, $\tau = 7.0$ msec. This suggests that probe oxidation reactions are minimized by the water-cooled stainless steel probe design.

2.2 Step Swirl Combustor (SSC) Experiments

2.2.1 Test Facility and Instrumentation

Figure 3 shows a schematic diagram of SSC, which has a 150-x150-mm cross section, length of 754 mm, and a step height of 55 mm. Fuel is supplied to the combustor by the annular fuel tube (20 mm i.d. and 29 mm o.d.) coaxially sandwiched between swirling air streams; the inner air jet (20 mm dia.) and the outer annular air jet (29 mm i.d. and 40 mm o.d.). The combustor exit has a 45% blockage orifice plate on top that simulates the back pressure exerted by the dilution jets in a practical gas turbine combustor. The SSC has quartz windows on all four sides to permit visual observations and laser diagnostics measurements. Stationary helical vane swirlers were located 25 mm upstream from the burner tube exit in each of the air passages. The inner swirler had six vanes with a central 1.4 mm dia. hole to prevent the flame from anchoring to the swirler. The outer swirler had 12 vanes. Inner swirler lengths are 25, 19, and 19 mm, respectively, for 30°, 45°, and 60° swirlers; outer swirler lengths are 32, 25, and 19 mm, respectively, for 30°, 45°, and 60° swirlers. We used flow visualization, CARS system for temperature measurements, and the LDA system for velocity measurements. The CARS and LDA systems are described below.

CARS System: A Coherent Anti-Stokes Raman Spectroscopy (CARS) optics system was used for unintrusive flame temperature measurements. Briefly, the CARS signal was generated by combining two 30 mJ doubled Nd: Yag beams at 532nm and one 25 mJ broad band dye laser beam centered at 607nm and pumped by the same Nd: Yag laser. The pulse laser and detector camera run at 10 Hz. A Boxcars configuration with an ellipsoidal probe volume approximately 25µm (dia.) x 250µm (length) was used for collecting the signal. The detector is a Princeton Instruments intensified 576x384 charge coupled device (CCD). The intensifier is triggered by a Princeton PG-10 pulsar. A Princeton ST-130 controller operates the camera and the detector chiller. The collection process is controlled by Princeton's ST-130 CSMA software package running on a personal computer. Spectra are fit to a library of spectra by a nonlinear fitting routine running on a personal computer. A total of 250 samples was taken for each CARS temperature measurement. LDA System: Unintrusive velocity measurements were made using a Dantec Fiber-Flow LDA system. Essentially, the 2-D LDA system uses the 514nm and 488nm lines from an Argon-ion laser. The laser output is directed into a Dantec Fiber flow transmitter where the colors are

separated and directed to optical fiber couplers by a Bragg cell operating at 40 MHz. The four beams are guided to the probe via polarization preserving fibers. The recollimated and focused laser beams cross to produce an ellipsoidal probe volume approximately $100\mu m$ (dia.) x $1000\mu m$ (length). A fluidized-bed seeder was used to inject submicron-sized ($97\% < 1\mu m$) ZrO_2 particles into each burner tube passage. Velocity biasing was resolved by seeding one passage at a time. The forward scattered signal is collected and separated by diachronic mirrors before it is detected by photo multiplier tubes and processed by individual TSI burst counters. Typical coincident sampling rates exceeded 1 kHz in flames. A total of 2048 coincident samples were collected for each velocity measurement. Custom-designed software was used to reduce the data on a personal computer. Three-component noncoincident velocity measurements were made with the 2D LDA system by scanning in the transverse and radial directions to get axial and tangential velocities, and axial and radial velocities, respectively.

2.2.2 Test Conditions

Table 2 lists the experimental test conditions for the SSC. Since increasing the inner vane angle increases turbulent mixing and strengthens the inner recirculation zone; these changes dramatically affect the flame structure and the stability characteristics. Therefore, experiments were performed to reveal the differences in flame structure by changing the inner vane angle. Test conditions were also chosen to compare: (i) attached versus lifted flames and (ii) co versus counterswirl configurations.

Experimental measurements included flame photography, three-component mean and rms velocities, mean and rms temperatures, and LBO. The LBO data were collected by maintaining a constant airflow rate, heating the combustor to a near steady-state temperature at stoichiometric fuel-air ratio, and then gradually decreasing the fuel flow rate until blowout occurred.

2.2.3 Error Analysis

For obtaining flame temperature, usually, 500 samples were taken for each CARS measurement to ensure that the error in the rms temperature was less than 10 K, while 1500 samples were taken in the flame region where the rms values were expected to be large. Overall, we estimated the CARS mean temperature measurement accuracy to be within 50 K, while the precision was well within 20 K. Unlike the LDA, CARS temperature measurements are time-averaged, without the density biasing effects. We also discovered that once system parameters are optimized and the dye laser is tuned, the CARS system can run for long periods of time. For example, we obtained repeatability to within ± 20 K for a mean flame temperature of 1500 K after 4 days of operation.

In processing the LDA Doppler burst signal to obtain velocity measurements, typically a total of 2⁵ cycles/burst are requested and the spurious data are filtered by using the 3s test. The error in rms velocity was less than 3 percent and uncertainty in mean velocity was less than 1 percent at a 95 percent confidence limit. However, in recirculatory and reactive flows, the velocity statistical biasing was worst. We found that the mean values can be overestimated up to 7 percent and the rms values underestimated up to 5 percent for turbulence intensity levels above 20 percent. The flow rates calculated from integrating the velocity profiles were 3 percent or less than the measured flow rates. This difference is partly attributed to the plus-or-minus 1 percent measurement accuracy of the mass flow controller. To eliminate velocity biasing due to non-uniform seeding, a conditional data sampling technique was used by seeding particles into only the

fuel jet or the annular coflowing air. This type of technique allowed us to track the convection and diffusion of one (seeded) fluid into another (unseeded) fluid.

2.3 Turbulent Swirling Flame Experiments

2.3.1 Test Facility and Instrumentation

Figure 4 shows the schematic of a turbulent swirling jet diffusion flame combustor. This combustor consists of a central fuel tube (9.45-mm inner diameter, 0.2-mm lip thickness, 806-mm length) and a concentric annular-air tube (26.92-mm inner diameter), centered in a vertical test section (150 x 150-mm square cross section with rounded corners, 486-mm length), through which external air is supplied. The test section has four quartz windows for laser diagnostic measurements. A helical vane swirler unit is placed in the annulus channel 96 mm upstream from the jet exit. We used flow visualization, CARS system for temperature measurements and LDA system for velocity measurements. The CARS and LDA systems are described below.

<u>CARS System</u>: The CARS optics layout was used for temperature measurements. The laser source is provided by a Nd:Yag pulse laser with a 10-ns time resolution and a Boxcars configuration is used. The probe volume is approximately 25-μm by 250-μm. The CARS signal is collected by a Spex 1702 spectrometer, 2-D charge coupled diode (CCD) camera from Princeton instruments, and Tracor-Northern multi channel analyzer. A total of 250 samples were taken for each CARS temperature measurements. The raw data is processed by in-house software on a personal computer.

LDA System: A custom-made three-component LDA system was used for velocity measurements. This is a three-beam two component (axial and radial) set using a 514.5 nm line of an 18 W argon-ion laser with a component separation based on polarization. A two-beam third component (tangential) set uses a 488.0 nm line with separation by color. Since the third component is normal to the first and second components, the measurement volume had a quasispherical shape of 100 μm diameter and the calculated fringe spacing was 3.6 μm. The LDA system has Bragg cell frequency shifting (10 MHz for the first and second channels and 30 MHz for the third channel) for measurements in recirculatory flows, 4-σ filtering software for spurious signals, for example, due to seed agglomeration, and a correction subroutine to account for the LDA signal biasing effects in combusting flows. A fluidized-bed seeder was used to inject sub micron-sized (0.1 μm) ZrO₂ particles into each passage. Counter type (TSI 1990C) signal processors and tailor-made coincidence circuit ensured valid data rate acquisition. All the LDA signals were processed using our custom-designed software which calculates intensity, shear stresses, higher moments (skewness and kurtosis), and pdfs. Typical LDA sampling rates exceeded 1 kHz for both isothermal and combusting flow measurements.

2.3.2 Test Conditions

Table 3 shows the test conditions employed using gaseous hydrogen as the fuel. All tests were performed at room temperature and atmospheric pressure. The fuel jet, air jet, and the external coflowing stream velocities were up to 30 m/s, 10 m/s, and 0.5 m/s, respectively. The flame stability limits were measured as follows. For a fixed annular- and coflowing-airflow rates, the fuel flow rate was increased gradually until the flame attached to the burner-rim, lifted above the burner, or simply extinguished (blowoff). Now, at the lift condition, fuel flow was: (1) decreased

until the flame reattached to the burner-rim (dropback), or (2) increased until the lifted flame extinguished (blowout). A three-component LDA, CARS, and Mie scattering systems were used for a variety of conditioned and unconditioned measurements of mean and turbulent quantities. For a set of values of jet, annulus, and external velocity, measurements extending up to 34 jet diameters were made at a large number of radial locations up to X 3.2 jet diameters.

2.3.3 Error Analysis

LDA Precision and Accuracy: In processing the LDA Doppler burst signal, typically a total of 2⁵ cycles/burst are requested and the spurious data are filtered by using the 3s test. The error in rms velocity was less than 3 percent and uncertainty in mean velocity was less than 1 percent at a 95 percent confidence limit. However, in recirculatory and reactive flows, the velocity statistical biasing was worst. We found that the mean values can be overestimated up to 7 percent and the rms values underestimated up to 5 percent for turbulence intensity levels above 20 percent. The flow rates calculated from integrating the velocity profiles were 3 percent or less than the measured flow rates. This difference is partly attributed to the plus-or-minus 1 percent measurement accuracy of the mass flow controller. To eliminate velocity biasing due to non-uniform seeding, a conditional data sampling technique was used by seeding particles into only the fuel jet or the annular coflowing air. This type of technique allowed us to track the convection and diffusion of one (seeded) fluid into another (unseeded) fluid.

CARS Precision and Accuracy: Usually, 500 samples were taken for each CARS measurement to ensure that the error in the rms temperature was less than 10 K, while 1500 samples were taken in the flame region where the rms values were expected to be large. Overall, we estimated the CARS mean temperature measurement accuracy to be within 50 K, while the precision was well within 20 K. Unlike the LDA, CARS temperature measurements are time-averaged, without density biasing effects. We also discovered that once system parameters are optimized and the dye laser is tuned, the CARS system can run for long periods of time. For example, we obtained repeatability to within X 20 K for a mean flame temperature of 1500 K after four days of operation.

Table 1: Well Stirred Reactor (WSR) Test Matrix.

Hydrocarbon	Carbon Number	(C/H)	τ (msec)	ф _{тіп}	фтах	$T_{f \min}(K)$	T _{f max} (K)
Methane	1	0.25	7.3	0.55	0.88	1507	1967
			6.32	0.59	0.83	1517	1918
Ethane	2	0.333	7.26	0.48	0.84	1407	1996
Cyclohexane	6	0.5	7.47	0.48	0.82	1429	1981
			5.22	0.51	0.78	1536	1922
n-Heptane	7	0.4375	7.19	0.53	0.84	1517	1975
			5.49	0.54	0.81	1595	1974
Toluene	7	0.875	7.32	0.46	0.79	1499	1946
			5.35	0.5	0.78	1552	1936
Ethylbenzene	8	0.8	7.43	0.48	0.76	1478	1958
			5.33	0.49	0.67	1546	1839
Cracked Fuel Simulant	2.52	0.5081	6.75	0.49	0.77	1530	2007
•			5.17	0.46	0.76	1391	1969
n-Dodecane	12	0.4615	7.39	0.46	0.8	1357	1979
			5.2	0.55	0.79	1581	1983

Table 2: Step Swirl Combustor (SSC) Test Conditions.

Variable	Range
Inner vane angle (deg.)	0, 30 and 45
Outer vane angle (deg.)	30
Vane configuration	Co- and counter-swirl
Inner air velocity (m/s)	14.4
Re	18,000
Outer air velocity (m/s)	8.6
Re	14,800
Fuel velocity (m/s)	2.5
Re	3,200
Equivalence ratio	0.9
Fuel	Methane

Table 3: Experimental Test Conditions for Turbulent Swirling Jet Diffusion Flames.

Case	θ	Uj	Ua	Uc
	(deg.)	(m/s)	(m /s)	(m/s)
1	0	25	4	1
2	0	100	20	4
3	30	100	20	4
4	45	100	20	4

3.0 LIST OF RELEVANT PUBLICATIONS

Journal Publications

- 1. F. Takahashi and M. D. Vangsness, "Near-Field CARS Measurements and the Local Extinction of Turbulent Jet Diffusion Flames," *Dynamics of Heterogeneous Combustion and Reacting Systems*, AIAA Progress in Astronautics and Aeronautics Series, Vol. 152, pp. 37-55, 1993.
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- 4. J. Zelina and D. R. Ballal, "Combustion Studies in a Well Stirred Reactor," AIAA Journal of Propulsion and Power, Vol. 10, pp. 132-139, 1994.
- 5. F. Takahashi, W. J. Schmoll, and J. L. Dressler, "Characteristics of a Velocity-Modulated Pressure-Swirl Atomizing Spray Measured by the Phase-Doppler Method," *AIAA Journal of Propulsion and Power*, Vol. 11, pp. 955-963, 1995.
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- 11. M. D. Durbin and D. R. Ballal, "Optimizing the Combustion Performance of a Step Swirl Combustor," AIAA Paper No. 94-3825, Proceedings of 29th Intersociety Energy Conversion Engineering Conference, pp. 631-635, AIAA, Washington D.C., 1994.

- 12. J. Zelina, R. C. Striebich, and D. R. Ballal, "Pollutant Emissions Research Using a Well Stirred Reactor," AIAA Paper No. 94-3827, in Proceedings of 29th Intersociety Energy Conversion Engineering Conference, pp. 644-648, AIAA, Washington D.C., 1994.
- 13. M. D. Durbin and D. R. Ballal, "Studies of Combustion and Emissions in a Model Step Swirl Combustor," *Proceedings of the FACT Vol. 18, pp. 17-21, ASME (Int.) Joint Power Generation Conference,* New York, NY, 1994.
- 14. J. Zelina and D. R. Ballal, "Studies of Pollutant Emissions in a Well Stirred Reactor," Proceedings of the FACT Vol. 18, pp. 12-16, ASME (Int.) Joint Power Generation Conference, New York, NY, 1994.
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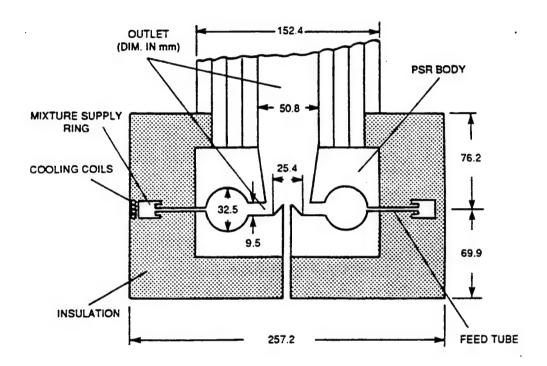


Fig. 1: Schematic diagram of a toroidal WSR (dimensions in mms)

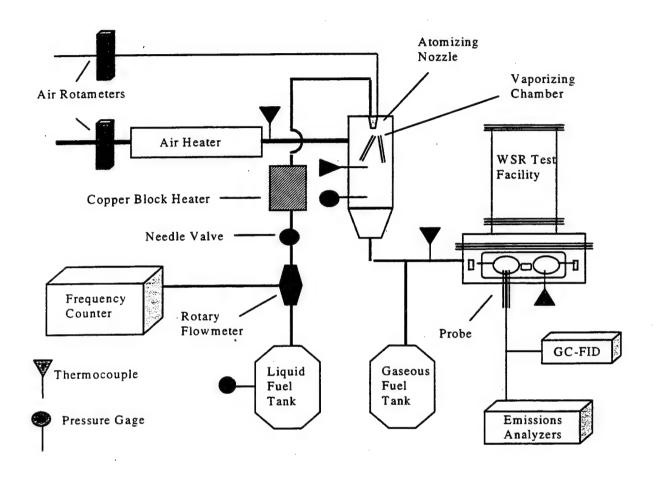


Fig. 2: WSR test facility and associated instrumentation.

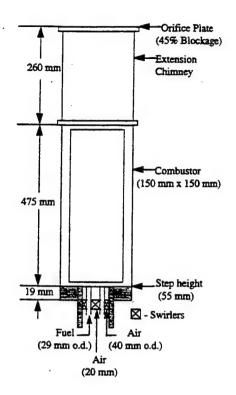


Fig. 3. Schematic of a Step Swirl Combustor.

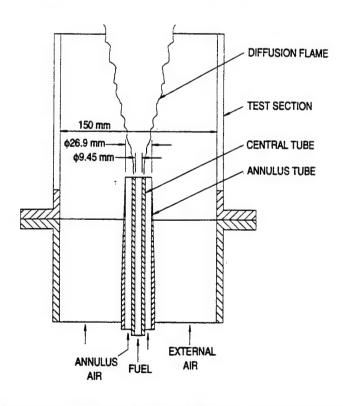


Fig. 4. Schematic of a swirling jet diffusion flame combustor

APPENDIX A WELL STIRRED REACTOR (WSR) (SELECTED DATA SET)

Table 1

n-Heptane Data							
CO2 (vol %)	O2 (vol %)	THC (ppmC)	Sample Temp (C)	Fuel/Air Temp (C)	m fuel (kg/s)	O NOx (slpm)	m NOx (9/s)
5.99	13.66		37.48	_	0.000285402	0.000461926	1.47047E-05
6.22	12.38	8.7	35.99			0.00079334	2.52547E-05
6.52			36.73	46.77	0.000289859	0.001021629	3.25219E-05
6.77	10.78		38.81	46.48	0.000293094	0.00073678	2.34542E-05
6.95	14.03			46.64	0.000294509	0.001540609	4.90427E-05
7.06	16.08	1.98		46.33	0.000295464	0.00166663	5.30544E-05
7.23				45.84	0.000298376	0.001666583	5.30529E-05
7.42	15.88	1.52	39.16	6 46.15	0.000297397	0.001986506	6.32371E-05
7.60				45.98	0.000297886	0.002363961	7.52528E-05
7.75	16.31		38.55	45.94	0.000298376	0.002902822	9.24065E-05
8.07	14.43		41.10	45.73	0.000302381	0.003299521	0.000105035
8.39		0.74		44.84	0.000311937	0.004427578	0.000140945
8.46						0.005078365	0.000161661
8.71						0.006017739	0.000191565
8.94			43.36			0.007597016	0.000241838
9.11			42.60		0.000316446	0.00913821	0.0002909
9.36			42.29		0.000317022	0.011121049	0.00035402
9.58			44.56	43.34	0.000318765	0.012663211	0.000403112
9.75	8.78			42.83	0.000324149	0.0148748	0.000473514
9.90			45.18	42.79	0.000324762	0.017341063	0.000552024
9.94	8.43	0.00	47.81	41.77	0.000324149	0.019061625	0.000606795

Table 1 cont.

From caloring to the part of										+	
From caloring to telephan m CO (g/s) EI CO Q THC (slpm) m THC (g/s) EI THC n D (0.00449935) T (1.436E-05 0.014490234) T (1.77 0.006419935 T (1.436E-05 0.144 0.98840477 1618 T (K) C (0.00148222 T (1.77 0.006419935 T (1.51242E-05 0.014 0.98840477 1618 T (1.77 0.006419935 T (1.61146-05 0.004 0.988418412 1638 T (1.77 0.006419935 T (1.61146-05 0.004 0.998418412 T (1.78 0.00094087 T (1.61146-05 0.004 0.998418412 T (1.78 0.00094087 T (1.61146-05 0.004 0.99916843 T (1.61146-05 0.0041685 T (1.61146-05 0.004 0.99916943 T (1.61146-05 0.0041696 T (1.61146-05 0.004 0.99916943 T (1.61146-05 T (1.61146-05 0.004 0.99916943 T (1.61146-05 T (1.6114											
From caloring telephane From caloring te											
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(sighm) m CO (gs) EI CO Q THC (slpm) m THC (gs) EI THC η AFT TY (K) 94300055 0.020482314 71.77 0.006449935 7.11436E-05 0.25 0.935600757 1590 2163328 0.01782820 0.02355413 3.9411E-05 0.04 0.988418412 1618 6666559 0.01782820 0.01847421 2.15222E-05 0.07 0.988418412 1658 7427854 0.01782820 0.01847422 1.6124E-05 0.07 0.999702834 1714 866559 0.011755879 0.000474742 1.6124E-05 0.04 0.990702834 1714 8665591 0.011755879 0.000474042 8.24523E-06 0.03 0.99134535 1714 88662694 0.011755879 0.000647687 7.4219E-06 0.02 0.99134536 1757 88662694 0.01175879 38.35 0.000647687 7.4219E-06 0.01 0.99134536 1737 88662694 0.01175879 37.58 0.0000456 7.4219E-06 <th></th>											
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1.059430055 0.020482314 71.77 0.006419935 7.11436E-05 0.02 0.983600757 1590 0.922165828 0.014822801 62.09 0.003556413 3.9411E-05 0.01 0.088418412 1618 0.756666559 0.01487222 51.14 0.001437921 1.61542E-05 0.04 0.98935935 1693 0.626955919 0.012121148 41.16 0.000044087 1.61546E-05 0.04 0.989418412 1658 0.680625991 0.012121148 41.16 0.000044042 8.24523E-06 0.04 0.99970835 1714 0.68162694 0.011755879 39.79 0.000044042 8.24523E-06 0.02 0.99134536 1757 0.57361266 0.011040643 37.29 0.0000417685 4.62865E-06 0.01 0.99158477 1827 0.57361266 0.011040663 3.2204E-06 0.01 0.99158477 1827 0.57361266 0.01140763 3.2204E-06 0.01 0.99158477 1918 0.738210968 0.0114774237 45.	EI NOx	Q CO (slpm)		0	Q THC (slpm)		I THC	F	AFT	T	(K)
0.76666559 0.017828501 62.09 0.00355413 3.9411E-05 0.014 0.985891477 1618 0.766665589 0.01482222 51.14 0.001942141 2.1522E-05 0.07 0.98918412 1658 0.62673784 0.010336052 44.48 0.001457492 1.61514E-05 0.06 0.98933535 1693 0.626673919 0.011758879 39.79 0.000649086 1.04249E-06 0.03 0.99104843 1774 0.679012546 0.011089833 37.29 0.000648287 6.0759B-06 0.09 0.99134536 1757 0.573612066 0.011089833 37.29 0.000648287 6.0759B-06 0.09 0.99134636 1757 0.573612066 0.0110406763 38.25 0.000648287 6.0759B-06 0.01 0.99138467 1821 0.57361206 0.0110406763 38.23 0.0000356144 3.7250B-06 0.01 0.99138467 1821 0.57361206 0.0110406763 38.23 0.0000356144 3.7250B-06 0.01 0.99138467	0.05			71.77	0.006419935	7.11436E-05	0.25	0.983600757		1590	1570
0.766666559 0.01482222 51.14 0.001942141 2.15222E-05 0.00 0.988418412 1658 0.67427854 0.01336052 44.48 0.001457492 1.61514E-05 0.06 0.999035935 1693 0.626955919 0.012121148 41.16 0.00040867 1.04264E-05 0.04 0.990108443 1714 0.680605694 0.011758874 82.4523E-06 0.02 0.09118443 1733 0.579602694 0.011168933 37.29 0.0000548287 6.02 0.991588108 1787 0.579602354 0.011199046 37.58 0.0000548287 6.02 0.991528038 1811 0.579602354 0.011199046 37.58 0.0000417685 4.62865E-06 0.01 0.991528038 1811 0.579602354 0.011406763 38.23 0.0000256169 3.28204E-06 0.01 0.99163847 1827 0.57821258 0.014674235 38.23 0.000256191 1.84721E-06 0.01 0.99163847 187 0.57821258 0.014674237 37	0.0	0.922163828	3 0.017828501	62.09	0.003556413	3.9411E-05	0.14	0.985891477		1618	1600
0.67427854 0.013036052 44.48 0.001457492 1.61514B-05 0.06 0.989935935 1693 0.626955919 0.01752879 41.16 0.00044042 8.24523B-06 0.02 0.991018443 1733 0.608062694 0.011755879 38.35 0.000669736 7.42179B-06 0.02 0.9913858108 1757 0.57900234 0.01194046 37.58 0.000417685 4.62865B-06 0.02 0.99138457 1757 0.590004965 0.011406763 38.23 0.000348287 4.62865B-06 0.01 0.99138457 1789 0.590004965 0.011406763 38.23 0.000336144 3.72504B-06 0.01 0.99138457 1827 0.640894491 0.01230667 46.75 0.00025601 2.8027B-06 0.01 0.99138457 1879 0.75801228 0.014674237 47.13 0.000166691 1.4320B-06 0.01 0.99138457 1978 0.75801228 0.014674237 47.13 0.000129309 1.4320B-06 0.01 0.991384972 1	0.11	0.766666559	L	51.14	0.001942141	2.15222E-05	0.07	0.988418412		8591	1643
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0.573612066 0.011089833 37.29 0.000548287 6.07593E-06 0.02 0.991588108 1789 0.573612066 0.011094046 37.58 0.000417685 4.62865E-06 0.02 0.991528038 1811 0.590004965 0.011406763 38.23 0.000336144 3.72504E-06 0.01 0.99138457 1821 0.640894491 0.012390627 40.98 0.00025901 2.80257E-06 0.01 0.990767944 1879 0.738219998 0.014272253 45.75 0.00025901 2.80257E-06 0.01 0.989389172 1918 0.758012258 0.014674237 47.13 0.000128582 1.4249E-06 0.01 0.988340638 1966 0.838610228 0.016213131 51.79 0.000128582 1.4249E-06 0.00 0.988340638 1966 0.926864394 0.017919378 56.73 0.000128582 1.4249E-06 0.00 0.986237794 2025 1.00747963 0.019347794 61.14 9.6879E-05 1.07388E-07 0.00 0.986237794	0.18		0.011442329	38.35	0.000669736	7.42179E-06	0.05	0.991345356		1757	1744
0.579002354 0.01194046 37.58 0.000417685 4.62865E-06 0.02 0.991528038 1811 0.590004965 0.011406763 38.23 0.000336144 3.72504E-06 0.01 0.99138457 1827 0.640894491 0.012390627 46.98 0.00025501 2.82204E-06 0.01 0.990767944 1879 0.73821999 0.014272253 45.75 0.000252901 2.82204E-06 0.01 0.990389172 1918 0.73821999 0.014674237 47.13 0.000129309 1.43296E-06 0.01 0.980938072 1935 0.759012258 0.0166713131 51.79 0.000128382 1.4249E-06 0.00 0.98340638 1966 0.838610228 0.019347794 61.14 9.68792E-05 1.07358E-06 0.00 0.98340638 1966 0.926864394 0.019347794 61.14 9.68792E-05 1.07358E-06 0.00 0.986237794 2025 1.11776253 0.021610076 68.17 5.14127E-05 5.69738E-07 0.00 0.98465815	0.21	0.573612066	5 0.011089833	37.29	0.000548287	6.07593E-06	0.02	0.991588108		1789	7771
0.590004965 0.011406763 38.23 0.000336144 3.72504E-06 0.01 0.99138457 1827 0.640894491 0.012390627 40.98 0.000252901 2.82204E-06 0.01 0.990767944 1879 0.73821998 0.014272253 45.75 0.000252901 2.80257E-06 0.01 0.989694875 1918 0.75901228 0.014674237 47.13 0.000166691 1.84721E-06 0.01 0.988340638 1966 0.838610228 0.016213131 51.79 0.000128582 1.4249E-06 0.00 0.988340638 1966 0.926864394 0.017919378 56.73 0.000128582 1.4249E-06 0.00 0.986237794 2025 1.00747963 0.019347794 61.14 9.68792E-05 1.07358E-06 0.00 0.986237794 2025 1.1176253 0.021610076 68.17 5.14127E-05 5.69738E-07 0.00 0.986458515 2024 1.137551537 0.025855933 79.78 3.65914E-05 1.60321E-07 0.00 0.980745371	0.25		1 0.011194046	37.58	0.000417685	4.62865E-06	0.02	0.991528038		1811	1798
0.04089491 0.012390627 40.98 0.000296169 3.28204E-06 0.01 0.990767944 1879 0.73821998 0.014272253 45.75 0.000252901 2.80257E-06 0.01 0.989694875 1918 0.759012258 0.014674237 47.13 0.000166691 1.84721E-06 0.00 0.983340638 1966 0.838610228 0.016213131 51.79 0.000129309 1.43296E-06 0.00 0.983340638 1966 0.926864394 0.017919378 56.73 0.000128582 1.4249E-06 0.00 0.984340638 2002 1.000747963 0.019347794 61.14 9.68792E-05 1.07358E-06 0.00 0.984658515 2025 1.1176253 0.021610076 68.17 5.14127E-05 5.69738E-07 0.00 0.984658515 2054 1.215337339 0.02285933 79.78 3.65914E-05 1.60321E-07 0.00 0.982046378 2121 1.45230253 0.028077849 86.62 1.37137E-07 1.51971E-09 0.00 0.980507457	0.31	0.590004965	5 0.011406763	38.23	0.000336144	3.72504E-06	0.01	0.99138457		1827	1814
0.738219998 0.014272253 45.75 0.000252901 2.80257B-06 0.01 0.989694875 1918 0.738019258 0.014674237 47.13 0.000166691 1.84721B-06 0.01 0.989389172 1935 0.838610228 0.016213131 51.79 0.000128582 1.4249E-06 0.00 0.988340638 1966 0.926864394 0.017919378 56.73 0.000128582 1.4249E-06 0.00 0.987229353 2002 1.00747963 0.019347794 66.114 9.68792E-05 1.07358E-07 0.00 0.984658515 2025 1.11776253 0.021610076 68.17 5.14127E-05 5.69738E-07 0.00 0.984658515 2054 1.215337339 0.02585933 79.78 3.65914E-05 1.60321E-07 0.00 0.982046378 2121 1.437255479 0.02778639 86.62 1.37137E-07 1.51971E-09 0.00 0.980507457 2158 1.455230253 0.028077849 0.00 0.980507457 0.980507457 2158	0.35		1 0.012390627	40.98	0.000296169	3.28204E-06	0.01	0.990767944		1879	1865
0.0159012258 0.014674237 47.13 0.000166691 1.84721E-06 0.00 0.98340638 1935 0.838610228 0.016213131 51.79 0.000128582 1.4249E-06 0.00 0.98340638 1966 0.926864394 0.017919378 56.73 0.000128582 1.4249E-06 0.00 0.987229353 2002 1.00747963 0.019347794 61.14 9.68792E-05 1.07358E-06 0.00 0.986237794 2025 1.11776253 0.023496522 73.71 2.98897E-05 3.569738E-07 0.00 0.984658515 2054 1.215337339 0.023496522 73.71 2.98897E-05 3.31228E-07 0.00 0.984658515 2098 1.337551537 0.02585933 79.78 3.65914E-05 1.60321E-07 0.00 0.980745331 2121 1.45230253 0.028077849 86.62 1.37137E-07 1.51971E-09 0.00 0.980507457 2155	0.45		3 0.014272253	45.75	0.000252901	2.80257E-06	0.01	0.989694875		1918	1902
0.838610228 0.016213131 51.79 0.000129309 1.43296E-06 0.00 0.988340638 1966 0.926864394 0.017919378 56.73 0.000128582 1.4249E-06 0.00 0.987229353 2002 1.000747963 0.019347794 61.14 9.68792E-05 1.07358E-06 0.00 0.986237794 2025 1.11776253 0.021610076 68.17 5.14127E-05 5.69738E-07 0.00 0.984658515 2054 1.21533733 0.023496522 73.71 2.98897E-05 3.31228E-07 0.00 0.983411422 2058 1.337551537 0.02585933 79.78 3.65914E-05 1.60321E-07 0.00 0.982046378 2121 1.45230253 0.028077849 86.62 1.37137E-07 1.51971E-09 0.00 0.980507457 2155	0.52		3 0.014674237	47.13	0.000166691	1.84721E-06	0.01	0.989389172		1935	1918
0.926864394 0.017919378 56.73 0.000128582 1.4249E-06 0.00 0.987229353 2002 1.000747963 0.019347794 61.14 9.68792E-05 1.07358E-06 0.00 0.986237794 2025 1.11776253 0.021610076 68.17 5.14127E-05 5.69738E-07 0.00 0.984658515 2054 1.215337339 0.023496522 73.71 2.98897E-05 3.31228E-07 0.00 0.983411422 2098 1.337551537 0.02585933 79.78 3.65914E-05 1.60321E-07 0.00 0.982046378 2121 1.437255479 0.027786939 85.56 1.44672E-05 1.60321E-07 0.00 0.98074531 2148 1.45230253 0.028077849 86.62 1.37137E-07 1.51971E-09 0.00 0.980507457 2155	0.61	0.838610228		51.79	0.000129309	1.43296E-06	0.00	0.988340638		1966	1947
1.000747963 0.019347794 61.14 9.68792E-05 1.07358E-06 0.00 0.986237794 2025 1.11776253 0.021610076 68.17 5.14127E-05 5.69738E-07 0.00 0.984658515 2054 1.215337339 0.023496522 73.71 2.98897E-05 3.31228E-07 0.00 0.983411422 2098 1.337551537 0.02585933 79.78 3.65914E-05 4.05494E-07 0.00 0.982046378 2121 1.437255479 0.027786939 85.56 1.44672E-05 1.60321E-09 0.00 0.98074531 2148 1.45230253 0.028077849 86.62 1.37137E-07 1.51971E-09 0.00 0.980507457 2155	0.77	0.926864394		56.73	0.000128582	1.4249E-06	0.00	0.987229353		2002	1981
1.11776253 0.021610076 68.17 5.14127E-05 5.69738E-07 0.00 0.984658515 2054 1.215337339 0.023496522 73.71 2.98897E-05 3.31228E-07 0.00 0.983411422 2098 1.337551537 0.02585933 79.78 3.65914E-05 4.05494E-07 0.00 0.982046378 2121 1.437255479 0.027786939 85.56 1.44672E-05 1.60321E-07 0.00 0.980745331 2148 1.45230253 0.028077849 86.62 1.37137E-07 1.51971E-09 0.00 0.980507457 2155	0.92			61.14	9.68792E-05	1.07358E-06	0.00	0.986237794		2025	2002
1.215337339 0.023496522 73.71 2.98897E-05 3.31228E-07 0.00 0.983411422 2098 1.337551537 0.02585933 79.78 3.65914E-05 4.05494E-07 0.00 0.982046378 2121 1.437255479 0.027786939 85.56 1.44672E-05 1.60321E-07 0.00 0.98074531 2148 1.45230253 0.028077849 86.62 1.37137E-07 1.51971E-09 0.00 0.980507457 2155	1.12			68.17	5.14127E-05	5.69738E-07	0.00	0.984658515		2054	2028
1.337551537 0.02585933 79.78 3.65914E-05 4.05494E-07 0.00 0.982046378 2121 1.437255479 0.027786939 85.56 1.44672E-05 1.60321E-07 0.00 0.980745331 2148 1.45230253 0.028077849 86.62 1.37137E-07 1.51971E-09 0.00 0.980507457 2155	1.26	_	_	73.71	2.98897E-05	3.31228E-07	0.00	0.983411422		8602	2069
1.437255479 0.027786939 85.56 1.44672E-05 1.60321E-07 0.00 0.98074531 2148 1.45230253 0.028077849 86.62 1.37137E-07 1.51971E-09 0.00 0.980507457 2155	1.46	_		79.78	3.65914E-05	4.05494E-07	0.00	0.982046378		2121	2089
1.45230253 0.028077849 86.62 1.37137E-07 1.51971E-09 0.00 0.980507457 2155	1.70			85.56	1.44672E-05	1.60321E-07	0.00	0.980745331		2148	2113
	1.87	1.45230253		86.62	1.37137E-07	1.51971E-09	0.00	0.980507457		2155	2119

Table 1 cont.

n-Heptane Data	e Data									Γ
									From calorimetri	etri
EI NOx	\sim	_		Q THC (slpm)	m THC (g/s)	EI THC	h	AFT	Tf (K)	
0.0		0.199980338 0.003866287	51.97				0.988304063	1609		1594
0.14	- 1		53.56			•	0.987946816	1638		1622
0.14			46.12				0.989620444	1665	1651	151
0.24			46.97				0.98943021	1757		1741
0.29			47.97				0.98920566			1761
0.50	- 1	0.004288244	27.67				0.987021801	1877		157
0.69	- 1	0.256003564 0.004949402	66.57				0.98501982			0
0.87		0.285354386 0.005516851	74.21				0.983299837			1932
1.19		0.335390468 0.006484216	87.22				0.98037151			1990
1.47		0.367646451 0.007107831	95.63				0.978480798			111
1.80	- 1	0.411627828 0.007958138	107.07				0.975906466			63
										Г
									1	

Table 2

Methane Data	lata									Γ
								From CETPC		
EI NOx	Q CO (slpm)	m CO (g/s)	EI CO	Q THC (slpm)	m THC (g/s)	EI THC	h	Tad-Q	Tf	
0.11	1.427523187	0.027598782	114.05	0.19555159	0.002167038	8.96	0.967989737	1535.25		1495
0.03	1.051367361	0.020326436	82.49	0.06760117	0.000749134	3.04	0.980286054	1586.77		1561
0.05	0.859019275	0.016607706	62.99	0.027631006	0.000306198	1.23	0.985266762	1619.52		1600
0.00	0.671099161	0.012974584	51.27	0.00687036	7.6135E-05	0.30	0.989336131	1652.34		1638
0.24	0.596006265	0.011522788	45.13	0.004185381	4.6381E-05	0.18	0.990694899	1684.33		1671
0.21	0.542003872	0.010478742	40.87	0.001251105	1.38643E-05	0.05	0.991685064	1715.81		1704
0.24	0.52599762	0.010169287	40.36	0.001255174	1.39094E-05	90.0	0.991786622	1730.3		1718
0.28	0.523015258	0.010111628	40.13	0.001262387	1.39893E-05	90.0	0.991832561	1744.89		1733
0.37	1	0.550303166 0.010639195	41.49	0.000843583	9.34831E-06	0.04	0.991576184	1774.63		1762
0.47	L	0.595696147 0.011516792	43.96	9.64195E-05	1.06849E-06	0.00	0.99110907	1806.03		1792
0.59		0.697880309 0.013492353	50.65	0.000111834	1.23931E-06	0.00	0.989757591	1850.54		1834
0.75		0.795270891 0.015375237	57.48	0.00012912	1.43087E-06	0.01	0.988376604	1878.43		1860
0.87	0.857125657	0.016571096	61.44	0.000796063	8.82171E-06	0.03	0.987548675	1904.58		1884
1.05	1.026408596	0.0198439	72.09	0.00078427	8.69101E-06	0.03	0.985396947	1933.74		1910
1.38		1.266021044 0.024476407	88.20	0.000315169	3.49259E-06	0.01	0.982158043	1986.33		1956
1.48	i	1.414584955 0.027348642	95.87	0.000417878	4.63078E-06	0.02	0.980604783	2013.27		1980
1.69	1.454991767	0.028129841	100.56	0.000399233	4.42416E-06	0.02	0.979656163	3 2024.65		1989
0.01		2.081849623 0.040249093	129.04		0.004235288	44.25		1639		1544
0.05		1.609074163 0.031108767		0.14		3.33		1658		1625
0.15		1.038756601 0.020082628	65.55			0.17	0.986579441	1710		1691
0.26		1.013079036 0.019586195	62.79	0.020247437	0.000224375	0.09		1725		1707
0.24		0.81889749 0.015832018		0		0.05		1742		1727
0.22		0.804098926 0.015545913		0.00629188	6.97245E-05	0.03		1764		1748
0.37	0.753472682	0.014567139	48.07			0.01	0.990269466	1810		1796
0.46	0.73789678	0.014266004			3.51759E-05	0.01	0.990405443	1837		1822
0.43	0.76937639	0.01487461	49.09		3.80451E-05	0.01	0.990068424			1870
0.56	0.877654443	0.016967986	55.39	0.002509377	2.78081E-05	0.01	0.988799157	1939		1920
0.76	0.994381061	0.019224701	61.42	0.001894361	2.09927E-05		0.987582435	1981		1960
0.77	1.015595233			0.003499969	3.87855E-05	0.01				1979
0.95	1.206618849	0.023327964	73.74	0.002248064	2.49123E-05	0.00	0.985091391	2034		2008
1.18	1.412699972	0.027312199	85.14	0.001635632	1.81255E-05	0.00	0.982788221	1 2060		2030
										\sqcap

Table 3

Toluene Data	ata								
									From calorimetrie
EI NOx	Q CO (slpm)	$\overline{}$	EI CO	Q THC (slpm)	m THC (g/s)	EI THC	η	AFT	Tf(K)
	1.52282931	0.029441367	107.33	0.285034644	0.003158659	11.52	0.961744428		
0.00	1.15075837	0.022247995	71.25				0.982248081	1585	5 1562
0.00	0.954687271	0.018457287	58.34				0.985465699	1625	5 1606
0.00	0.787585701	0.015226657	47.61				0.988138017	1665	5 1649
0.01	0.734045583		44.13				0.98900451	1689	9 1674
0.01	0.711321576	0.013752217	42.65				0.989374102	1710	0 1695
0.00	0.703636848	0.013603646	41.78				0.989590394	1743	
0.13	0.667873784	0.012912226	41.19				0.989737572	1774	
0.16	0.694591677	0.013428772	42.61				0.989383188	1798	
0.24	0.772246114	0.014930092	46.87				0.988321759	1840	0 1822
0.49	0.825983822	0.015969021	49.80				0.987593488	1878	8 1859
89.0	0.876777168	0.016951025	52.64				0.98688448	1907	7 1886
0.84	1.02864168	0.019887072	60.14				0.985017251	1968	8 1943
1.00	1.126568162	0.021780318	65.49				0.983685087	1997	7 1969
1.17	1.263354084	1.263354084 0.024424846	71.62				0.982157195	2040	2009
1.50	- 1	1.371607361 0.026517742	77.29				0.98074509	2071	1 2037
1.63	1	1.429798214 0.027642765	79.95				0.980080983	2077	7 2042
1.86		1.504731419 0.029091474	83.75				0.979133879	2103	3 2065
1.88	1.485276721	0.02871535	82.80				0.979371775	2115	5 2078
2.12	1.523663702	1.523663702 0.029457498	84.68				0.978904081	2134	1 2095

						From calorimetri
m CO (g/s)	EI CO		μ		AFT	Tf (K)
1.672386825 0.032332812	84.81			0.978870992	15	1566 1540
1.518894954 0.029365302	75.09			0.981293258	15	1593 1569
1.424239061 0.027535289	60.69			0.982786106	16	1613 1591
1.337902538 0.025866116	63.54			0.984170813	16	1637 1616
1.264854858 0.024453861	57.68			0.985629974	16	1687
1.261544361 0.024389858	89.95			0.985877857	L I	1704 1684
1.270685854 0.024566593	56.24			0.985988698	71	1721
1.282212796 0.024789447	55.76			0.986109154	17	1737 1718
1.307017662 0.025269008	56.20			0.985999107	11	1774 1754
1.269026634 0.024534515	55.55			0.986159912	18	1802 1782
1.369081331 0.026468906	58.73			0.985367611	18	1847 1825
1.426483912 0.027578689	61.06			0.984788873	18	1878 1854
1.472452046 0.028467406	63.17			0.984262811	51	1903 1878
1.608998141 0.031107297	67.92			0.983078713	51	1945
1.742971917 0.033697457	71.85			0.98209916	119	1985
1.818164453 0.035151179	74.23			0.981507267	20	2017 1985
1.912084282 0.036966963	77.49			0.980694725	30	2046 2013
1.975032016 0.038183952	79.45			0.980207021	20	2069 2035
2.090147773 0.040409524	83.66			0.979157932	20	2093 2057
2.08991328 0.04040499	83.23			0.979265012	2]	2124 2087
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Table 4	Ethylbenzene d

Ethylbenzene data	B					
						From calorimetr
0		m CO (g/s)	EI CO	h	Tad-Q	Tf
	1.07023932	0.020691294	74.88	0.981680273	1496.28	1475
0.05 0.9472		0.018313368	64.41	0.984242422	1516.15	1497
0.03 0.8467		0.016371447	57.58	0.98591333	1535.02	1518
		0.015397969	54.79	0.986595981	1534.65	1518
0.05 0.7467	0.746781736	0.01443778	50.88	0.987552801	1553.7	1538
0.04 0.7210	0.721026572	0.013939847	48.40	0.988159441	1554.22	1540
0.06 0.6570	0.657076728	0.012703483	43.66	0.9893187	1591.53	1578
0.04 0.6393	0.639391602	0.012361571	43.18	0.989436845	1590.96	1578
0.13 0.6087	0.608776113	0.011769672	40.37	0.990124198	1609.89	1597
0.15 0.5927	0.592720133	0.011459256	39.18	0.990414435	1628.1	1616
0.12 0.5981	0.598117336	0.011563602	39.74	0.990277131	1627.97	1615
0.15 0.5909	0.590994319	0.01142589	38.58	0.99056197	1664.4	1652
0.19 0.6003	0.600333595	0.011606449	39.36	0.990372158	1681.77	1669
0.30 0.6010	0.601091553	0.011621103	39.15	0.99042114	1699.66	1687
0.21 0.6091	136626	0.609136626 0.011776641	39.30	0.990386572	1717.26	1704
0.33 0.6667	759479 (0.666759479 0.012890683	42.73	0.98954601	1734.9	1720
0.38 0.6861	175258	0.686175258 0.013266055	43.05	0.98946881	1752.96	1738
0.44 0.7276	608422	0.727608422 0.014067096	46.37	0.988654927	1769.08	1753
	120274	0.754120274 0.014579659	46.93	0.988519234	1787.11	1770
	295006	0.819295006 0.015839703	50.81	0.987570638	1820.34	1802
	161503	0.846161503 0.016359122	53.15	0.986998512	1819.69	1800
	035177	0.913035177 0.017652013	56.75	0.986116096	1836.76	1816
		0.018600389	59.24	0.985507273	1837.71	1816
	\rightarrow	0.018108238	58.08	0.985790527	1868.76	1847
-		0.021725476	28.79	0.983396586	1902.66	1877
		0.022815467	71.19	0.982585045	1918.37	1891
		0.024320683	76.35	0.981321921	1933.58	1904
_	_	0.024739707	76.33	0.981326903	1935.04	1905
1.71 1.4076	1.407638441	0.027214343	85.02	0.97920179	1950.17	1916
1.92 1.4483	1.448391582 (0.028002237	85.52	0.979078194	1981.77	1947

Ethylbenzene data	sene data						
							From calorimet
EI NOx	Q CO (slpm)	m CO (g/s)	EI CO		h	Tad-Q	Tf
0.03	1.452267943	0.02807718	15.60		0.981504155	1523.66	1502
0.0	1.431794889	0.027681368	73.34		0.982057964	1543.45	1522
0.00	1.228189258	3 0.023744992	61.87		0.984863552	1582.14	1563
0.08		1.196335015 0.023129144	58.62		0.985658017	1601.9	1584
90.0		1.153693299 0.022304737	55.33		0.986464466	1640.1	1622
0.13	i i	1.158119413 0.022390309	54.42		0.986687756	1677.74	1660
0.20		1.217472473 0.023537801	56.12		0.986271674	1732.79	1714
0.33		1.298497938 0.025104293	59.27		0.985501178	1768.73	1748
0.45	1	1.416507585 0.027385813	64.01		0.984340559	1804.22	1781
0.69		3 0.03038468	69.73		0.982941969	1856.65	1831
				1			

Table 5

EI NOx Q CO (slpm) 1.01813458 0.04 1.72801090 0.05 1.33567109 0.06 1.0877505 0.07 0.83578167 0.10 0.5931036 0.12 0.47807107 0.14 0.45278408 0.18 0.41526819 0.22 0.40951025 0.35 0.45789308 0.35 0.47742749	Q CO (slpm) 1.018134583 1.728010909 1.728010909 1.335671095 1.08775057 0.835781675 0.478071072 0.452784081 0.415268198 0.409510256 0.430100047 0.457893086 0.477427491 0.587467367 0.645379013	QCO (slpm) m CO (g/s) i 1.018134583 0.019683935 1.728010909 0.033408211 1.335671095 0.025822975 1.08775057 0.021029844 0.835781675 0.016158446 0.59310364 0.01146667 0.478071072 0.009242707 0.452784081 0.008753826 0.415268198 0.008028519 0.409510256 0.007917198 0.430100047 0.008315268 0.457893086 0.0088526 0.477427491 0.009230265			m THC (g/s) E 0.001452488 0.0001452488 0.000268092 0.000113343 3.42809E-05 8.96998E-06 4.10921E-06 4.10921E-06 2.98856E-06 2.76935E-06 2.51282E-06 2.51282E-06	61 THC 4.96 3.84 0.97 0.01 0.02 0.02 0.02 0.01 0.01	0.97955362 0.968001745 0.968001745 0.977472811 0.986558656 0.996558656 0.990496017 0.992280058 0.992280058	Tad-Q 1471.36 1489.58 1507.87 1526.15 1579.32	From calorimeta Tf (K) 6 1435 8 1463
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	slpm) 134583 134583 110909 671095 775057 781675 310364 371072 784081 268198 510256 100047 1467367 467367		57.16 57.16 57.16 57.75 11.07 11.39 5.25 8.22	10 S S S S S S S S S S S S S S S S S S S	188 188 188 188 188 188 188 188 188 188	9.84 9.84 9.84 0.97 0.02 0.02 0.02 0.01 0.01 0.01		Tad-Q	Tf (K)
	134583 310909 571095 775057 781675 310364 371072 784081	0.019683935 0.033408211 0.025822975 0.021582446 0.016158446 0.016158446 0.009242707 0.008753826 0.008753826 0.008315268 0.008315268 0.008315268	67.16 122.08 93.46 75.75 57.75 41.07 33.38 31.46 29.26 29.26 29.70 31.39 32.56	0.131071291 0.094836805 0.024192425 0.01022801 0.0003093479 0.000506604 0.000444292 0.000370812 0.000370812 0.000249904 0.000249904	0.001452488 0.00105095 0.000268092 0.000113343 3.42809E-05 8.96998E-06 5.61402E-06 4.92349E-06 4.10921E-06 3.51036E-06 2.98856E-06 2.76935E-06	4.96 3.84 0.97 0.12 0.03 0.02 0.01 0.01	0.97955362 0.968001745 0.977472811 0.986558656 0.9960496017 0.992280058 0.992280058 0.992236632		
		0.033408211 0.025822975 0.021029844 0.016158446 0.01146667 0.009242707 0.008753826 0.008753826 0.008315268 0.008315268 0.008315268 0.008315268	122.08 93.46 93.46 75.75 57.75 41.07 33.38 31.46 29.26 29.26 29.26 29.70 31.39 32.56	0.094836805 0.024192425 0.01022801 0.003093479 0.000506604 0.000506604 0.000370812 0.000370812 0.000370812 0.000249904 0.000249904	0.00105095 0.000268092 0.000113343 3.42809E-05 8.96998E-06 5.61402E-06 4.92349E-06 4.10921E-06 3.51036E-06 2.98856E-06 2.76935E-06	3.84 0.97 0.01 0.02 0.02 0.01 0.01	0.968001745 0.977472811 0.982121772 0.986558656 0.990496017 0.992280058 0.992725647		
		0.025822975 0.021029844 0.016158446 0.01146667 0.009242707 0.008753826 0.008028519 0.007917198 0.008315268 0.0083526 0.009230265	93.46 75.75 57.75 41.07 33.38 31.46 29.26 29.26 29.70 31.39 32.56	0.024192425 0.01022801 0.003093479 0.000809443 0.000506604 0.00044292 0.000370812 0.000316772 0.000269685 0.000249904	0.000268092 0.000113343 3.42809E-05 8.96998E-06 5.61402E-06 4.10921E-06 3.51036E-06 2.98856E-06 2.76935E-06	0.01 0.02 0.02 0.02 0.01 0.01	0.982121772 0.982121772 0.98658656 0.990496017 0.992280058 0.992725647		
		0.021029844 0.016158446 0.01146667 0.009242707 0.008753826 0.007917198 0.008315268 0.0083526 0.0083526 0.009230265	57.75 57.75 41.07 33.38 31.46 29.26 29.70 29.70 31.39 32.56	0.0022801 0.003093479 0.000809443 0.000506604 0.000444292 0.000370812 0.000316772 0.000269685 0.000249904	0.000113343 3.42809E-05 8.96998E-06 5.61402E-06 4.92349E-06 4.10921E-06 3.51036E-06 2.98856E-06 2.76935E-06	0.01 0.02 0.02 0.01 0.01 0.01	0.986558656 0.986558656 0.990496017 0.992280058 0.992725647 0.993236632		
		0.016158446 0.01146667 0.009242707 0.008753826 0.008028519 0.007917198 0.008315268 0.008315268 0.008315268	29.76 29.26 29.26 29.70 31.39 32.56	0.003093479 0.000809443 0.000506604 0.000444292 0.000316772 0.000316772 0.000249904 0.000226754	3.42809E-05 8.9699BE-06 5.61402E-06 4.92349E-06 4.10921E-06 3.51036E-06 2.98856E-06 2.76935E-06	0.03 0.02 0.02 0.01 0.01 0.01	0.986558656 0.990496017 0.992280058 0.992725647 0.993236632		
		0.01146667 0.009242707 0.008753826 0.008028519 0.007917198 0.008315268 0.0088526 0.009230265	41.07 33.38 31.46 29.26 29.26 29.70 31.39 32.56	0.000809443 0.000506604 0.000444292 0.000370812 0.000316772 0.000249904 0.000249904	8.96998E-06 5.61402E-06 4.92349E-06 4.10921E-06 3.51036E-06 2.98856E-06 2.76935E-06	0.03 0.02 0.01 0.01 0.01	0.992280058 0.992725647 0.993236632		5 1510
		0.009242707 0.008753826 0.008028519 0.007917198 0.008315268 0.0083526 0.009230265	33.38 31.46 29.26 28.58 29.70 31.39 32.56	0.000506604 0.00044292 0.000370812 0.000316772 0.000269685 0.000249904	5.61402E-06 4.92349E-06 4.10921E-06 3.51036E-06 2.98856E-06 2.76935E-06 2.51282E-06	0.02 0.01 0.01 0.01 0.01	0.992280058 0.992725647 0.993236632		
		0.008753826 0.008028519 0.007917198 0.008315268 0.0088526 0.009230265	31.46 29.26 28.58 29.70 31.39 32.56	0.000444292 0.000370812 0.000316772 0.000269685 0.000249904	4.92349E-06 4.10921E-06 3.51036E-06 2.98856E-06 2.76935E-06 2.51282E-06	0.01 0.01 0.01 0.01	0.993236632		
	268198 510256 100047 100047 127491 467367 467367	0.008028519 0.007917198 0.008315268 0.0088526 0.009230265	29.26 28.58 29.70 31.39 32.56	0.000316772 0.000316772 0.000269685 0.000249904 0.000226754	4.10921B-06 3.51036B-06 2.98856B-06 2.76935B-06 2.51282B-06	0.01	0.993236632		
	393086 393086 427491 467367 467367	0.007917198 0.008315268 0.0088526 0.009230265 0.011357702	28.58 29.70 31.39 32.56	0.000316772 0.000269685 0.000249904 0.000226754	3.51036E-06 2.98856E-06 2.76935E-06 2.51282E-06	0.01	0 002206407		
		0.008315268 0.0088526 0.009230265 0.011357702	31.39 32.56 38.22	0.000269685 0.000249904 0.000226754	2.98856E-06 2.76935E-06 2.51282E-06	0.01	10,775570401		
	1 1 1 1	0.0088526 0.009230265 0.011357702	31.39 32.56 38.22	0.000249904	2.76935E-06 2.51282E-06	0.01	0.993140264	1699.32	1690
	1 1 1	0.009230265	32.56	0.000226754	2.51282E-06	0.01	0.992751185	1716.23	
	1 1	0.011357702	38.22	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		TO.0	0.992482111		1738
Ì				0.000206818	2.29189E-06	0.01	0.991177706		
0.66 0.6453	240260	0.012477328	41.74	0.000188113	2.08461E-06	0.01	0.990366144	1815.57	1801
0.81 0.715540362	700040	0.01383378	45.96	0.000176522	1.95616E-06	0.01	0.989392431	1831.85	
	332888	0.780932888 0.015098036	49.91	0.000164278	1.82048E-06	0.01	0.988483831	1862.76	5 1845
	0.820912651	0.015870978	52.00	0.000157147	1.74146E-06	0.01	0.988000537	1878.46	1860
	114393	0.914414393 0.017678678	57.51	0.00015051	1.6679E-06	0.01	0.986729893	1908.87	1888
1.40 1.0126	544203	1.012644203 0.019577788	62.41	0.000146328	1.62155E-06	0.01	0.985600265	1939.7	1916
_	1.109310004	0.02144666	67.19	0.000140966	1.56214E-06	00.0	0.984497365	1955.91	1931
	31874	1.15231874 0.022278162	69.39	0.000136555	1.51326E-06	00.0	0.983991873	1970.74	1944
	11397	1.24011397 0.023975537	74.38	0.000127556	1.41353E-06	0.00	0.982841611	1985.85	1957
2.30 1.3574	10162	1.357410162 0.026243263	80.84	0.000122669	1.35938E-06	00.0	0.981351808	2028.49	1997
									- Annual Control of

												-												
		0.984640248	0.987579872	0.988713282	0.988914084	0.98796886	0.987593074	0.985861117	0.984916117	0.981886859	0.980288285	0.979892924	0.978615088	0.978525315										
	ЕІ ТНС п	0.44	0.18	0.02	0.00	0.05	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03										
	m THC (g/s)	0.000152644	6.42121E-05	2.69919E-05	2.35804E-05	2.2516E-05	1.7748E-05	1.52785E-05	1.43485E-05	1.38187E-05	1.31107E-05	1.26111E-05	1.22487E-05	1.18476E-05										
	Q THC (slpm)	0.01377443	0.005794448	0.002435723	0.002127873	0.00203182	0.001601567	0.00137872	0.001294794	0.001246989	0.001183098	0.001138017	0.001105311	0.001069115										
	EI CO	64.67	53.08	48.63	47.81	51.93	53.61	61.15	65.26	78.40	85.34	87.06	92.60	93.00										
	m CO (g/s)	0.022238005	0.019184611	0.01847162	0.019069358	0.02189595	0.022642651	0.026912207	0.028560379	0.034892711	0.038719894	0.040214024	0.042602707	0.043576135										
le data	Q CO (slpm)	1.150241659 0.022238005	0.992307483 0.019184611	0.955428599	0.986346086	1.13254914	1.171171581	1.392010714 0.026912207	1.477260974 0.028560379	1.804795419 0.034892711	2.00275312	2.080035739	2.203588279 0.042602707	2.25393804										
Cyclohexane data	EI NOx																							

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Ethane data	ta								
EI NOx	\circ	m CO (g/s)		Q THC (slpm)	m THC (g/s)	EI THC	μ	AFT	Tf
0.00	7		128.88	0.151877866	0.00168306	6.42	0.96613968		
0.04	1		133.08	0.131811214	0.001460688	5.71	0.96595908		
0.05		0.021436349	83.79	0.010317853	0.000114339	0.45	0.981715202		
0.07			53.27	0.00185912	2.06021E-05	0.08	0.988579725		
0.10	- 1	0.010100011	37.94	0.000867873	9.61748E-06	0.04	0.991887632		
0.12	0.442023781	0.008545793	32.35	0.000618939	6.85888E-06	0.03	0.993086779		
0.14	0.398042466	0.007695488	29.36	0.000523008	5.7958E-06	0.02	0.993726689		
0.20	0.376183563	0.007272882	27.32	0.000449581	4.98211E-06	0.02	0.994165692		
0.27		0.007277209	27.55	0.000362923	4.02179E-06	0.02	0.994119901		
0.36	0.417292917	0.008067663	29.84	0.000325502	3.60711E-06	0.01	0.993634785		
0.42	0.430769095 0.008328203	0.008328203	31.04	0.000303481	3.36307E-06	0.01	0.993379632		
0.53	1	0.507510296 0.009811866	35.47	0.000282268	3.128E-06	0.01	0.992437814		
0.64		0.54927239 0.010619266	38.68	0.000264998	2.93662E-06	0.01	0.991755166		
0.80	0.643967657 0.012450041	0.012450041	44.34	0.000250288	2.77361E-06	0.01	0.990550935		
0.91	0.680285389 0.013152184	0.013152184	46.84	0.000232937	2.58133E-06	0.01	0.99001928		
1.11	0.778085678	0.01504299	52.41	0.000214723	2.37949E-06	0.01	0.98834577		
1.29	0.855255642 0.016534942	0.016534942	58.03	0.000203854	2.25905E-06	0.01	0.987638866		
1.50		0.018890153	64.41	0.000196207	2.1743E-06	0.01	0.986280172		
1.78		1.126209477 0.021773383	73.20	0.000190764	2.11399E-06	0.01	0.984408588		
2.05	1.244480706	0.02405996	80.33	0.000182589	2.02339E-06	0.01	0.982891911		
2.27	1.355660373	0.026209434	86.31	0.000176448	1.95534E-06	0.01	0.981619619		
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	From calorimetri	Tad-Q																										
	Fro		0.850147865	0.942853624	0.962271381	0.973313649	0.974421812	0.979569927	0.983947455	0.985657762	0.986044194	0.986099594	0.986139046	0.985389025	0.98459366	0.983704415	0.982175427	0.980337953	0.978584503	0.977860165								
		EI THC 11	84.72	10.43	3.23	0.77	0.55	0.32	0.32	0.22	0.21	0.21	0.20	0.19	0.19	0.18	0.17	0.17	0.16	0.16								
		m THC (g/s)	0.019103728	0.002281966	0.000735116	0.000185162	0.000130548	7.6485E-05	8.16652E-05	5.65836E-05	5.60127E-05	5.59327E-05	5.28838E-05	5.15996E-05	5.04874E-05	4.91963E-05	4.79267E-05	4.7945E-05	4.66428E-05	4.66488E-05								
		Q THC (slpm)	1.723903871	0.20592265	0.066336188	0.016708883	0.011780532	0.006901937	0.007369393	0.005106055	0.005054539	0.005047319	0.004772192	0.004656299	0.004555943	0.004439428	0.004324863	0.004326513	0.004209006	0.004209544								
		EI CO	277.66	199.13	147.08	110.49	106.68	85.74	67.05	60.21	58.60	58.36	58.23	61.46	64.88	69.89	75.24	83.11	19.06	93.71								
		m CO (g/s) EI CO	0.062614	0.043562	0.033519	0.026681	0.025212	0.020784	0.016906	0.015725	0.01564	0.015492	0.015299	0.016484	0.01761	0.018708	0.02084	0.024018	0.026565	0.02784								
		Q CO (slpm)	3.238634235	2.253203628	1.733723266	1.380051604	1.304054844	1.07501896	0.874463884	0.813386248	0.35 0.808957661	0.80129035	0.44 0.791314992	0.58 0.852596928	0.73 0.910885885	0.89 0.967644447	1.07793366	1.58 1.242317485	2.04 1.374072653	1.440013554								
Neat data			0.19	0.05	0.10	0.07	0.07	0.13	0.17	0.27	0.35	0.40	0.44	0.58	0.73	0.89	1.17	1.58	2.04	2.28								
POSF 2926 Neat data		m NOx (g/ EI NOx	4.37E-05	1.09E-05	2.19E-05	1.65E-05	1.68E-05	3.13E-05	4.16E-05	7.05E-05	9.26E-05	0.000107	0.000116	0.000156	0.000198	0.000241	0.000325	0.000456	0.000598	0.000676								

From CETPC Tad-Q 0.962915205 0.980572496 0.984196278 0.988586472 0.989947485 0.99054913 0.948540792 0.990501554 0.990723038 0.990651483 0.99038383 0.989604856 0.984299476 0.972581 0.986373021 0.988809806 0.98706161 0.983664853 0.982324909 0.9812055990.979988943 0.985761177 0.14 0.00 80.0 90.0 2.58 0.63 0.24 0.07 90.0 0.05 0.05 0.05 6.990.05 0.04 0.04 0.04 0.04 0.03 0.04 EI THC 1.63245E-05 3.93364E-05 2.65978E-05 1.86525E-05 1.45424E-05 1.40505E-05 1.3128E-05 1.10942E-05 0.001849817 0.000173349 6.48911E-05 2.14903E-05 1.72934E-05 1.53961E-05 1.18733E-05 1.13255E-05 1.08308E-05 1.02976E-05 0.000700751 1.24209E-05 1.16901E-05 0.004519807 Q THC (slpm) | m THC (g/s) 0.407863464 0.166925868 0.063235198 0.015642833 0.005855718 0.003549685 0.002400159 0.001939268 0.001683186 0.001560544 0.001473108 0.001389335 0.001267903 0.00118466 0.001120855 0.001071436 0.001054902 0.001022005 0.001001128 0.001312291 0.000977361 0.000929244 132.29 109.18 82.61 68.44 49.76 41.46 56.69 59.28 43.86 40.84 41.31 42.05 45.48 48.99 62.42 68.85 40.51 71.65 77.54 82.47 Q CO (slpm) | m CO (g/s) | EI CO0.035008 0.016505 0.01426 0.018436 0.029616 0.022583 0.012479 0.011605 0.011432 0.013239 0.016695 0.023918 0.025858 0.018854 0.014003 0.011853 0.022029 0.011621 0.0121 0.021068 0.027723 1.531864542 0.08 0.975187779 0.95356205 0.04 1.810783343 0.06 1.168090805 0.10 0.85370205 0.12 0.724297523 0.16 0.64547474 0.20 0.600279968 0.23 0.591315656 0.30 0.601103208 0.89 0.863526916 1.32 1.089733388 0.35 0.613088431 0.52 0.684758108 0.65 0.737584396 1.45 1.139429304 1.237141126 1.337481562 1.433930462 1.975340027 0.40 0.625842902 0.05 1.10 1.71 1.92 m NOx (g/{EI NOx Table 1.37E-05 1.31E-05 2.68E-05 1.15E-05 1.72E-05 2.17E-05 3.42E-05 6.59E-05 8.49E-05 9.93E-05 0.000114 0.00015 0.000188 0.000326 Dodecane 4.48E-05 5.47E-05 0.000263 0.000403 0.000444 0.000527 0.0006020.00069

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	From CETPC	Tad-O																											
			0.936841046	0.971293173	0.978947282	0.982649095	0.985450271	0.98731826	0.988914655	0.989617904	0.989795516	0.988972154	0.988306929	0.987224221	0.985762792	0.984868309	0.98438458	0.982717131	0.981949518	0.980971411	0.979264843								
		2	19.04	3.18	0.98	0.40	0.22	0.15	0.12	0.10	0.00	0.08	80.0	0.08	0.07	0.07	0.07	0.02	0.07	0.07	0.07								
		EI THC																											
		m THC (g/s)	0.005892677	0.001023589	0.000322803	0.000134222	7.47702E-05	5.1599E-05	4.28291E-05	3.91119E-05	3.56849E-05	3.46511E-05	3.34703E-05	3.29333E-05	3.22339E-05	3.19553E-05	3.16752E-05	3.106E-05	3.05807E-05	3.0232E-05	2.97545E-05				-				
:		O THC (slpm) m	-	0.092367778	0.029129489	0.01211212	0.006747196	0.00465625	0.00386486	0.003529423	0.003220177	0.003126886	0.003020334	0.002971868	0.002908762	0.002883617	0.002858338	0.002802828	0.002759577	0.002728108	0.002685019								
		C	193.93	112.23	88.25	74.52	63.01	55.11	48.21	45.18	44.46	48.11	51.05	55.82	62.26	66.19	68.33	75.67	79.05	83.35	98.06	-							
		(σ/s) EI CO							9		-	,			0)	~			~	~	16								
		m CO (9/s)	0.060016	0.036164	0.02916	0.025087	0.02171	0.019538	0.017616	0.016962	0.017612	0.019887	0.02134	0.023881	0.026792	0.028833	0.029944	0.033577	0.0353	0.037463	0.041375								
		O CO (slnm)	00	1.87056285	0.06 1.508280786	0.08 1.297598116	1.122932965	1.010566917	0.15 0.911158577	0.19 0.877345771	0.28 0.910982158	1.028638383	1.103809539	1.23523187	1.385787027	1.491342782	1.548825605	1.736735288	1.825884679	1.937720309	2.140092976		-						
				0.05	90.0	80.0	0.00	0.11	0.15	0.19	0.28	0.39	0.50	0.63	08.0	0.92	1.00	1.21	1.36	1.50	1.81								
2011		FI NOv																											
Tanta .	Dodecane	m NOx (a/EI NOx	1.54E-05	1.67E-05	2.11E-05	2.56E-05	3.11E-05	4.05E-05	5.38E-05	7.21E-05	0.000109	0.000161	0.000207	0.000271	0.000345	0.000402	0.000439	0.000537	0.000607	0.000676	0.000822								

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Table 9

0.49 25381 09013 29.17075741 28.5 0.252 3.65 1.49346 Apporizer (C) NOX (ppmV) COZ (ppmV) COZ (ppmV) 0.49 25.381 09013 29.17075741 28.5 0.252 3.65 1.49346 6.79 18.70 2.21 1.39.1.68 0.51 25.381 1288 29.10683770 28.5 0.623 3.65 1.49346 6.79 18.70 3.47 1084.26 0.55 25.386.29172 29.1108707602 28.4 9.597 375.191425 6.79 18.87 6.74 1184.2 0.65 25.386.29172 29.1108707602 28.4 9.597 375.191425 6.79 18.87 6.74 118.87 6.74 118.42 0.69 25.340.89870 28.4 9.79 375.3088293 375.3088293 375.3088293 38.4 37.93 38.8 3.8 3.8 3.8 3.8 3.8 3.8 3.8 3.8 3.8	Endother	Endothermic Simulant data	lata							
0.45 A. S.										
25381.00013 29.17075741 285.0223 3651.49346 6.95 20.72 192 25378.12618 29.170683779 28.50428 36.524377 6.79 18.70 2.21 2536.2361.282 29.16683779 28.50428 3735.191425 6.79 18.28 5.68 2536.29172 29.17960760 284.935 3735.191425 6.79 18.87 6.74 25340.28377 29.1796760 284.935 3735.191425 6.75 18.87 6.74 25340.28377 284.935 3735.191425 6.75 19.41 11.84 25340.28082 29.179866 284.935 3735.191425 6.75 19.42 11.40 25340.28027 29.18877 375.30382 29.188779 375.294954 6.75 19.42 17.40 25310.280487 3745.294954 6.76 19.42 17.40 19.29 17.45 25310.280487 3745.294954 6.76 19.42 17.40 19.44 6.32 18.45 17.45 17.46 17.46 <th>Phi</th> <th>A</th> <th></th> <th>R</th> <th>В</th> <th>Tau (ms)</th> <th>Vaporizer (C)</th> <th>NOx (ppmV)</th> <th>CO (ppmV)</th> <th>CO2 (vol %)</th>	Phi	A		R	В	Tau (ms)	Vaporizer (C)	NOx (ppmV)	CO (ppmV)	CO2 (vol %)
25346.1286 20.1689497 285.0438 3675.94377 6.90 18.70 221 25366.1282 29.16863779 28.6363 3748.46887 6.77 17.10 3.47 25346.66643 29.17907602 284.9499 3735.191425 6.79 18.87 6.74 25346.66643 29.17907602 284.9597 3735.191425 6.76 19.37 8.70 25346.66643 29.1790876 284.9597 3735.888373 6.76 19.16 11.84 25340.28372 29.189877 3733.03827 6.75 19.42 17.40 25310.39413 29.199886 284.877 3733.03827 6.76 19.29 33.84 25282.27130 29.1982556 284.877 3745.9957 6.76 19.27 33.84 25282.7130 29.1982556 284.756 3775.9024 6.76 19.27 33.84 25282.7346 29.1082556 284.756 3775.9024 6.76 19.27 10.745 25286.38445 29.1082556 284.756 <td< td=""><td>0.49</td><td>i</td><td></td><td>285</td><td></td><td></td><td></td><td></td><td></td><td>7.01</td></td<>	0.49	i		285						7.01
25368.1282 29.16683779 285.0635 3748.496897 6.77 17.10 3.47 25336.1282 29.16683779 28.19349 3773.514634 6.72 18.28 5.68 25340.2872 29.1746771 28.4925 3735.19142 6.76 19.37 8.70 25340.2872 29.1746771 28.4925 3735.19142 6.61 19.16 11.84 25340.28872 29.17841609 284.956 383.2.50751 6.61 19.16 11.84 25340.80826 29.17841609 284.956 388.718018 6.63 19.29 14.16 25340.80876 29.188779 3735.9587 6.76 19.29 14.16 25340.20871 29.186774 3745.99454 6.76 19.29 14.16 25282.208.2038 29.1667749 284.756 3745.99454 6.76 19.29 14.36 25298.2037 29.18677 3745.994504 6.72 19.44 6.32 25298.2037 29.18677 3745.9454 6.72 19.29 14.	0.51		3 29.16894971		3675.94377	06'9		2.21	1237.11	7.20
25386 29172 29.17907602 284.9439 3773.574634 6.72 18.28 5.68 25346 29172 29.17907602 284.9597 373.5191425 6.79 18.87 6.74 25340 28827 29.1809927 284.9597 373.5191425 6.61 19.16 11.84 25340 28826 29.1809927 284.9504 381.718018 6.63 19.29 14.16 25333.26032 29.1888370 284.877 3753.038527 6.75 19.29 14.16 2538.230413 29.1888370 284.837 3745.294954 6.76 19.29 23.05 2528.27130 29.1888770 284.7561 3775.20492 6.76 19.29 23.05 2528.28.3845 29.2186047 3745.901239 6.73 19.24 63.28 2528.28.3844 29.2186047 284.5524 3775.5323 6.74 19.29 2.58 2528.06.0839 29.21860487 3745.901239 6.74 19.24 63.28 2528.07.3469 29.12860487 284.5524 3742	0.53		29.16683779		3748.496897	6.77	17.10		1084.26	
25346,66643 29,17746377 284,9597 3733,191425 6.79 18,87 6.74 25340,28872 29,1874607 284,952 375,088493 6.76 19,37 8.70 25340,28872 29,1804926 284,952 375,088493 6.76 19,16 11,84 25340,8087 29,1857 382,2025 6.75 19,29 1740 2538,2082 29,1858705 284,875 3745,294954 6.76 19,29 1740 2528,181,7955 29,1967749 284,875 3745,294954 6.76 19,27 33,84 2528,181,795 29,186277 284,875 3779,72681 6.69 19,44 6.328 2528,181,795 284,776 375,37234 6.70 19,93 77.45 2528,181,795 284,578 3775,7284 3775,7284 6.70 19,93 77.45 2528,181,7807 284,578 3742,90123 6.74 20,58 20,58 20,58 2528,186,3843 29,1266,919 374,83 374,29123 374,	0.56				3773.574634		18.28	5.68		8.04
25340.28372 2918099276 284.9252 3750.898493 6.76 19.37 8.70 25340.28372 2918099276 284.935 3818.718018 6.63 19.16 11.84 25340.80826 29.17841609 284.935 3818.718018 6.63 19.29 14.16 25318.703013 29.1883370 284.837 3745.294954 6.76 19.29 23.08 25298.20382 29.1862724 284.7761 375.99994 6.76 19.29 23.08 25298.20382 29.1862725 284.7567 3765.90994 6.76 19.27 33.84 25298.20382 29.2180977 284.786 3775.72831 6.79 19.44 6.37 25298.2046.0897 28.47667 376.99294 6.76 19.27 107.82 25286.23445 29.186097 284.486 3774.2901239 6.76 19.27 107.82 25267.54693 29.22864.886 37.42.901239 6.76 19.27 107.82 25267.54693 29.22864.886 37.42.201239 <td< td=""><td>0.57</td><td></td><td></td><td></td><td>3735.191425</td><td></td><td>18.87</td><td>6.74</td><td></td><td>8.16</td></td<>	0.57				3735.191425		18.87	6.74		8.16
25340.80826 29.17841609 284.9504 3832.502751 6.61 19.16 11.84 25333.20022 29.1799896 284.935 3818.718018 6.63 19.29 14.16 25318.37003 29.1799896 284.937 3745.294954 6.75 19.29 23.05 25310.30413 29.196823705 284.8779 375.294954 6.76 19.27 33.84 25292.71301 29.19823556 284.7567 375.9997 6.76 19.14 46.37 25292.71301 29.21862755 284.7567 3776.30924 6.72 19.14 46.37 25286.3845 29.21862755 284.7567 3775.3234 6.70 19.34 46.37 2528.6.3845 29.21862255 284.7564 3774.59129 6.75 19.34 46.37 2528.6.3846 29.21862257 284.5274 374.29123 6.75 19.34 17.45 2526.7.3469 29.228798 284.527 374.29123 5.46 19.27 10.782 2526.7.3469 29.138449 <td>0.59</td> <td></td> <td></td> <td>284</td> <td></td> <td></td> <td></td> <td>8.70</td> <td></td> <td></td>	0.59			284				8.70		
2533.2.6032 29.1799896 284.935 3818.718018 6.63 19.29 14.16 25318.7055 29.1888705 284.8377 373.03827 6.75 19.29 23.05 2538.2038.2038 29.19016405 284.8377 3745.294954 6.76 19.29 23.05 2528.203.71301 29.19016405 284.7761 3739.9924 6.72 19.14 46.37 2528.638445 29.1062725 284.7761 3779.72881 6.79 19.44 63.28 2528.638445 29.2180977 284.5634 3775.537234 6.74 20.58 92.59 2528.63847 29.2180977 284.564 4247.634363 5.67 19.27 107.82 2528.7387 29.228733 284.527 3742.901239 6.75 19.27 107.82 2528.67.3469 29.13669119 285.4564 4247.634363 5.66 19.44 63.28 2528.0.5346 29.13668119 285.3491 4525.759129 5.74 19.27 10.78 258.0.2.734.3 29	0.60			284		6.61	19.16	11.84	1322.35	
25318.7955 29.18583705 284.8779 3753.038527 6.75 19.42 17.40 25310.30413 29.19016405 284.8377 3745.294954 6.76 19.29 23.05 25208.0382 29.19627249 284.7761 3739.9597 6.76 19.27 33.84 25208.71301 29.1982255 284.7567 3765.90924 6.70 19.14 46.37 25286.38445 29.2180277 284.5758 3775.7034 6.70 19.44 63.28 25286.38445 29.2180977 284.5758 3745.994204 6.74 20.58 92.59 25267.34693 29.2280487 284.578 3742.901239 6.75 19.27 107.82 25267.54693 29.2227303 284.5227 3742.901239 6.75 19.27 107.82 25267.54693 29.2227303 284.5227 3742.901239 5.67 18.42 1.22 2580.2567.54693 29.2227303 284.527 3742.9123 5.34 18.53 1.52 2580.2767.54693 29.2	0.62				3818.718018		19.29	14.16		8.91
25310.30413 29.19016405 284.8357 3745.294954 6.76 19.29 23.05 25298.20382 29.19627249 284.7761 3739.9597 6.76 19.27 33.84 25292.71301 29.19627249 284.7567 3765.909924 6.76 19.27 46.37 25280.2081 29.21682255 284.7568 3779.72881 6.79 19.24 63.28 25280.60839 29.218097 284.5634 3775.53723 6.79 19.37 107.85 25267.54693 29.22227303 284.5227 3742.901239 6.75 19.27 107.82 25267.54693 29.22227303 284.5227 3742.901239 6.75 19.27 107.82 25267.54693 29.22227303 284.5227 3742.901239 5.67 18.42 1.22 2580.5746 20.12669119 285.349 478.73323 5.39 18.53 1.52 2580.12796.7340 20.1380721 285.3449 478.73323 5.09 19.25 22.06 25706.73516 20.1	0.62			284			19.42	17.40	1609.91	9.13
25298.20382 29.19627249 284.7761 3739.9597 6.76 19.27 33.84 25292.71301 29.1982555 284.7567 3765.90924 6.72 19.14 46.37 25286.38445 29.21682255 284.7567 3765.90924 6.79 19.14 46.37 25280.60839 29.2188275 284.5578 3779.72681 6.69 19.44 63.28 25260.60839 29.2188077 284.5527 3742.901239 6.75 19.27 107.82 25267.54693 29.2226733 284.5227 3742.901239 6.75 19.27 107.82 25267.54693 29.22227303 284.5227 3742.901239 6.75 19.27 107.82 25280.25469 29.22227303 285.3931 4522.759129 5.67 18.43 1.22 2580.2546.546 4247.634363 5.67 18.43 1.52 2580.2531.2 29.1380721 285.3494 4788.73923 5.39 18.53 2.06 2580.126676 29.1380721 285.1541 4980	0.64		_	284	3745.294954		19.29	23.05		
25292.71301 29.19825556 284.7567 3765.909924 6.72 19.14 46.37 25286.38445 29.21880277 284.5758 3779.72681 6.69 19.44 63.28 25280.60839 29.21880977 284.5634 3775.33234 6.75 19.93 77.45 25270.77807 29.22860487 284.5634 3746.994204 6.75 19.27 107.82 25267.54693 29.22680487 284.5227 3742.901239 6.75 19.27 107.82 25267.54693 29.12669119 285.4564 4247.634363 5.67 18.42 1.22 25323.353453 29.12669119 285.4564 4247.634363 5.67 18.43 1.22 25801.27946 29.1380721 285.399 475.318894 5.46 18.53 2.06 25801.27945 29.1380721 285.3449 4778.732384 5.18 19.41 3.91 25786.79204 29.1576667 285.1449 4778.73238 5.09 19.25 9.25 25706.79204 29.1	0.67			284	3739.9597	6.76	19.27	33.84	2359.23	9.78
25286.38445 29.1682255 284.5758 3779,72681 6.69 19.44 63.28 25280.60839 29.2180977 284.5634 3775,537234 6.70 19.93 77.45 25280.60839 29.22680487 284.4786 3746,994204 6.74 20.58 92.59 25267.277807 29.22680487 284.4786 3742,901239 6.75 19.27 107.82 25267.24693 29.2227303 284.5227 3742,901239 6.75 19.27 107.82 25267.24693 29.12669119 284.5264 4247.634363 5.96 20.00 19.27 107.82 2580.5744 29.134839 285.369 4723.18894 5.46 18.53 1.52 2580.5744 29.1380721 285.3449 4788.73923 5.18 19.41 3.91 2576.75516 29.1380721 285.3449 4788.83341 4980.823181 5.18 19.25 9.25 2576.75516 29.1680566 285.54834 4.89 19.04 43.08 25773.51203	0.69			284	3765.909924		19.14	46.37	2930.84	10.17
25280.60839 29.2180971 284.5634 3775.537234 6.70 19.93 77.45 25272.77807 29.22680487 284.4786 3746.994204 6.74 20.58 92.59 25267.274807 29.22680487 284.4786 3742.901239 6.75 19.27 107.82 25223.53453 29.2227303 284.5227 3742.901239 6.75 19.27 107.82 2581.2847 29.13669119 285.4564 4247.634363 5.06 20.00 1.22 2581.2847 29.136087 285.3331 4552.759129 5.67 18.42 1.22 25809.5734 29.136082 285.334 4722.18894 5.46 18.53 2.06 25801.27945 29.136072 285.1541 498.8233181 5.18 19.41 3.91 25706.79204 29.1545667 285.1541 498.8233181 5.18 19.25 13.41 25718.65769 29.16806968 285.0514 496.80233 5.03 19.25 2.25 25736.7347 29.18859127 <td>0.73</td> <td></td> <td></td> <td>284</td> <td></td> <td>69.9</td> <td>19.44</td> <td>63.28</td> <td></td> <td>10.53</td>	0.73			284		69.9	19.44	63.28		10.53
25272.77807 29.2680487 284.4786 3746.994204 6.74 20.58 92.59 25267.54693 29.2227303 284.5227 3742.901239 6.75 19.27 107.82 25323.53453 29.12669119 285.4564 4247.634363 5.67 18.42 1.22 25814.28275 29.1314839 285.369 4723.18894 5.67 18.53 1.52 25809.57344 29.1380721 285.369 4723.18894 5.46 18.53 2.06 25801.27945 29.1380721 285.369 4723.18894 5.46 18.53 2.06 25801.27945 29.1380721 285.349 4788.73923 5.39 18.53 2.06 25780.79249 29.1380721 285.324 4976.808272 5.18 19.41 3.91 25778.6576 29.16806968 285.0514 4980.823181 5.18 19.25 9.25 25748.2301 29.18869127 284.954 5210.118309 5.03 19.34 43.08 25708.7638 29.20547094	0.74			284	3775.537234	6.70	19.93	77.45		10.79
25267.54693 29.2227303 284.5227 3742.901239 6.75 19.27 107.82 25323.53453 29.12669119 285.4564 4247.634363 5.06 20.00 12.22 25814.28275 29.135608 285.369 4723.18894 5.46 18.53 1.52 25809.57344 29.1380721 285.349 4788.73923 5.39 18.53 2.06 25801.27945 29.1380721 285.349 478.873923 5.39 18.53 2.06 25801.27945 29.1380721 285.349 478.873923 5.39 18.53 2.06 25796.79204 29.15045514 285.237 4976.808272 5.18 19.41 3.91 25778.6576 29.16806968 285.0514 4980.823181 5.08 19.25 13.41 25778.6576 29.16806968 285.0514 5060.800233 5.09 19.25 13.41 25778.671.51536 29.19861571 284.851 5216.390563 4.93 19.34 43.68 25736.748.2301 29.188591	0.75			284		6.74	20.58	92.59	4462.56	10.99
25323.53453 29.12669119 285.4564 4247.634363 5.96 20.00 25814.28275 29.12669119 285.4564 4247.634363 5.67 18.42 1.22 25809.57344 29.135608 285.3931 4723.18894 5.67 18.53 1.52 25801.27945 29.1380721 285.3449 4788.73923 5.39 18.53 2.06 25796.79204 29.1380721 285.3449 4788.73923 5.18 19.41 3.91 25796.79204 29.15756667 285.1541 4980.823181 5.18 19.31 6.12 25778.65769 29.15756667 285.0514 5060.800233 5.09 19.25 9.25 25748.23011 29.16806968 285.0514 5060.800233 5.03 19.25 9.25 25748.23011 29.18859127 284.851 5216.390563 4.93 19.04 34.08 25723.51203 29.19861571 284.7864 5274.576775 4.87 19.54 43.55 25706.5941 29.2246321 284.4	0.77			284.	3742.901239	6.75	19.27	107.82	4847.14	11.12
25323.53453 29.12669119 285.4564 4247.634363 5.96 20.00 2523.53453 25814.28275 29.13314839 285.369 4723.18894 5.67 18.42 1.22 25809.57344 29.135608 285.369 4723.18894 5.46 18.53 1.52 25801.27945 29.1380721 285.3449 4788.73923 5.39 18.53 2.06 25801.27945 29.13604514 285.237 4976.808272 5.18 19.41 3.91 25706.79204 29.1575667 285.1541 4980.823181 5.18 19.41 3.91 25778.6769 29.1575667 285.1541 4980.823181 5.09 19.25 9.25 25748.23011 29.16806968 285.0514 5060.800233 5.03 19.25 9.25 25748.23011 29.18859127 284.851 5216.390563 4.89 19.04 34.08 25723.51203 29.19861571 284.6864 5274.576775 4.87 19.54 43.55 25706.5941 29.2246321										
25814.28275 29.13314839 285.3931 4552.759129 5.67 18.42 1.22 25809.57344 29.1380721 285.369 4723.18894 5.46 18.53 1.52 25809.57344 29.1380721 285.3449 4788.73923 5.39 18.53 2.06 25801.27945 29.1380721 285.2237 4976.808272 5.18 19.41 3.91 25778.65769 29.1576667 285.1541 4980.823181 5.18 19.41 3.91 25778.65769 29.1576667 285.1541 4980.823181 5.09 19.25 9.25 25748.23011 29.16806968 285.0514 5060.80023 5.03 19.25 9.25 25748.23011 29.18859127 284.9549 5120.118309 5.03 19.25 13.41 25736.748.23011 29.18861571 284.9549 5216.390563 4.93 19.24 43.55 25708.768.76833 29.20847094 284.6864 5274.576775 4.81 19.91 70.96 25707.03194 29	0.46		29.12669119	285.	4247.634363	5.96	20.00		4377.68	5.97
25809.57344 29.135608 285.369 4723.18894 5.46 18.53 1.52 25801.27945 29.1380721 285.3449 4788.73923 5.39 18.53 2.06 25706.79204 29.1380721 285.3449 4788.73923 5.18 19.41 3.91 25778.65769 29.15756667 285.1541 4980.823181 5.09 19.25 9.25 25778.65769 29.16806908 285.0514 5060.800233 5.09 19.25 9.25 25761.51536 29.16806908 285.0514 5060.800233 5.03 19.25 13.41 25748.23011 29.16806908 284.9549 5120.118309 5.03 19.25 13.41 25736.74373 29.18859127 284.851 5216.390563 4.93 19.04 34.08 25723.51203 29.19861571 284.7652 5248.57184 4.81 19.54 43.55 25706.5941 29.2246321 284.4997 5428.400955 4.74 19.91 70.96	0.48		59.13314839	285.	4552.759129	2.67	18.42	1.22	2418.28	6.70
25801.27945 29.1380721 285.3449 4788.73923 5.39 18.53 2.06 25796.79204 29.15045514 285.2237 4976.808272 5.18 19.41 3.91 25778.65769 29.15746667 285.1541 4980.823181 5.18 19.31 6.12 25778.6576 29.16806968 285.0514 5060.800233 5.09 19.25 9.25 25748.23011 29.1795479 284.9549 5120.118309 5.03 19.25 13.41 25748.23011 29.1795479 284.9549 5120.118309 5.03 19.36 22.26 25736.74373 29.18859127 284.851 5216.390563 4.87 19.04 34.08 25708.76383 29.20547094 284.6864 5274.576775 4.87 19.54 43.55 25708.76394 29.2246321 284.4997 5428.400955 4.74 19.91 70.96 25707.03194 29.2246321 284.4997 5428.400955 4.74 19.91 70.96	0.50			28.	4723.18894	5.46	18.53	1.52	1884.72	6.97
25796.79204 29.15045514 285.2237 4976.808272 5.18 19.41 3.91 25778.65769 29.15756667 285.1541 4980.823181 5.18 19.31 6.12 25778.65769 29.15756667 285.0514 5060.800233 5.09 19.25 9.25 25748.23011 29.1795479 284.9549 5120.118309 5.03 19.25 13.41 25736.748.23011 29.178859127 284.851 5216.390563 4.93 19.36 22.26 25736.743.51203 29.19861571 284.6864 5274.576775 4.81 19.04 34.08 25708.76383 29.20547094 284.6864 5274.576775 4.81 20.06 56.30 25706.5941 29.21821238 284.4997 5428.400955 4.74 19.91 70.96 25707.03194 29.2246321 284.4997 5428.400955 4.74 19.91 70.96	0.51			285.3449	4788.73923	5.39	18.53	2.06	1614.41	7.12
25778.65769 29.15756667 285.1541 4980.823181 5.18 19.31 6.12 25761.51536 29.16806968 285.0514 5060.800233 5.09 19.25 9.25 25748.23011 29.1795479 284.9549 5120.118309 5.03 19.25 13.41 25736.74373 29.18859127 284.851 5216.390563 4.93 19.04 34.08 25723.51203 29.19861571 284.7532 5265.548344 4.89 19.04 34.08 25708.76383 29.20547094 284.6864 5274.576775 4.81 20.06 56.30 25706.5941 29.21821238 284.4997 5428.400955 4.74 19.91 70.96 25707.03194 29.2246321 284.4997 5428.400955 4.74 19.91 70.96	0.54		29.15045514	285.	4976.808272	5.18	19.41	3.91	1363.10	7.79
25761.51536 29.16806968 285.0514 5060.800233 5.09 19.25 9.25 25748.23011 29.17795479 284.9549 5120.118309 5.03 19.25 13.41 25736.748.23011 29.18859127 284.851 5216.390563 4.93 19.36 22.26 25723.51203 29.19861571 284.7532 5265.548344 4.87 19.04 34.08 25708.76383 29.20547094 284.6864 5274.576775 4.87 19.54 43.55 25706.5941 29.21821238 284.5622 5342.857184 4.81 20.06 56.30 25706.5941 29.2246321 284.4997 5428.400955 4.74 19.91 70.96 25707.03194 29.2246321 284.4997 5428.400955 4.74 19.91 70.96	0.56		29.15756667	285.	4980.823181	5.18	19.31	6.12	1366.62	8.07
25748.23011 29.17795479 284.9549 5120.118309 5.03 19.25 13.41 25736.74373 29.18859127 284.851 5216.390563 4.93 19.36 22.26 25723.51203 29.19861571 284.7532 5265.548344 4.89 19.04 34.08 25708.76383 29.20547094 284.6864 5274.576775 4.81 20.06 56.30 25706.5941 29.21821238 284.5622 5342.857184 4.74 19.91 70.96 25707.03194 29.2246321 284.4997 5428.400955 4.74 19.91 70.96	0.61		29.16806968	285.	5060.800233	5.09	19.25	9.25	1575.82	8.57
25736.74373 29.18859127 284.851 5216.390563 4.93 19.36 22.26 25723.51203 29.19861571 284.7532 5265.548344 4.89 19.04 34.08 25708.76383 29.20547094 284.6864 5274.576775 4.87 19.54 43.55 25706.5941 29.21821238 284.5622 5342.857184 4.74 19.91 70.96 25707.03194 29.2246321 284.4997 5428.400955 4.74 19.91 70.96	0.63		29.17795479	284.	5120.118309	5.03	19.25	13.41	1875.61	9.02
25723.51203 29.19861571 284.7532 5265.548344 4.89 19.04 34.08 25708.76383 29.20547094 284.6864 5274.576775 4.87 19.54 43.55 25706.5941 29.21821238 284.5622 5342.857184 4.81 20.06 56.30 25707.03194 29.2246321 284.4997 5428.400955 4.74 19.91 70.96	99.0	- 1	29.18859127	284	5216.390563	4.93	19.36	22.26	2432.12	9.46
25708.76383 29.20547094 284.6864 5274.576775 4.87 19.54 43.55 25706.5941 29.21821238 284.5622 5342.857184 4.81 20.06 56.30 25707.03194 29.2246321 284.4997 5428.400955 4.74 19.91 70.96	0.69			284.7532	5265.548344	4.89	19.04	34.08	3167.15	10.05
25706.5941 29.21821238 284.5622 5342.857184 4.81 20.06 56.30 25707.03194 29.2246321 284.4997 5428.400955 4.74 19.91 70.96	0.72		29.20547094	284.	5274.576775	4.87	19.54	43.55	3620.30	10.34
25707.03194 29.2246321 284.4997 5428.400955 4.74 19.91 70.96	0.75		29.21821238		5342.857184	4.81	20.06	56.30	4205.11	10.62
	0.76			284.4997	5428.400955	4.74	16.91	70.96	4726.33	10.85

	(Vann)		2276.13	1944.95	1745.79	1644.90	1616.48	1590.10	1588.99	1630.99	1681.37	1879.65	2164.22	2258.33	2541.87	2861.05	3137.46	3572.54	3987.31	4387.16	4792.65	4875.48		
	OD (Amun) AON	.12	1.96	2.59	16.1	4.04	4.43	4.48	2.50	99'9	8.27	89.6	12.98	15.11	18.24	23.45	28.65	35.54	41.55	48.79	57.83	63.99		
	Vanorizer (C)	55.19	57.79	57.65	56.78	56.05		55.79	55.94	55.39	55.58		54.27	55.11	54.91	54.14	53.78	52.89	53.67	53.02	53.46	52.07		
	Ton (me)	6.96	86.9	7.04	7.06	7.05	7.06	7.08	7.21	7.23	7.25	7.29	7.15	7.21	7.22	7.27	7.27	7.31	7.39	7.30	7.34	7.36		
		3598.188235	3588.342965	3554.617129	3538.323046	3544.297251	3536.797326	3525.222547	3462.527898	3449.876377	3438.301502	3417.216265	3483.213013	3455.224811	3448.546695	3425.308791	3420.134462	3401.511903	3362.714653	3403.823893	3385.971771	3376.969453		
		280.1225927	279.9466747	279.6891799	279.4615201	279.3278213	279.2043809	279.0482632	278.8344128	278.6873073	278.5797437	278.2289539	277.9640368	277.8493933	277.6355158	277.3858619	277.22342	277.0221852	276.7130157	276.548169	276.3613164	276.3117014		
	Δ	29.68129032	29.699942	29.72728513	29.7515021	29.76574249	29.77890237	29.79556262	29.81841415	29.83415385	29.84567323	29.88330252	29.91178318	29.92412508	29.94717724	29.97413041	29.99169406	30,01348067	30.04701451	30,06492515	30.08525255	30.09065472		
	N N	5043.53727	25028.94317	25010.7048	24996.86983	24986.98476	24977.31933	24969.04374	24951.90658	24941.4313	24933.32385	24918.56232	24915.45835	24906.5479	24896.45455	24886.7421	24878.18375	24868.58981	24857.15735	24853.9739	24845.78781	24840.57207		
Table	n-Heptane Data	1916		99135	99122	60166	96066	68066		75066	99043	99030	99017	99004	16686	82686	59686	98952	68636	98926	98913	00686		

	CO (ppmV)	2271.577146	2276.9165	2038.732912	2088.128663	2144.500733	2639.560558	3083,232435	3457.558598	4113.701172	4509.350579	2080												
	NOx (ppmV)	2.43628936	3.578662	3.7911134	6.5161628	8.0082035	13.80015624	19.31249992	24.7279296	34.119727	42.01110775	51.8168985												
	Vaporizer (C)	53.41	51.33	52.48	53.85	52.51	53.54	53.20	52.37	53.19	54.92	52.61								-				
	Tau (ms)	5.53	5.16	5.48	5.47	5.46	5.55	5.51	5.55	5.58	5.56	2.60												
	В	4674.587902	5025.820495	4712.859838	4718,190991	4728.440525	4644.471346	4674.248842	4638.487865	4610.375171	4625.020883	4586.125995												
		280.0022176	279.8219305	279.6479283	279.0486913	278.9143068	278.2439601	277.9184416	277.683168	277.2349374	277.063943	276.6601333												
	X	29.69405054	29.71318218	29.73167028	29.79551691	29.80987277	29.88169086	29.91669049	29.94203812	29.9904481	30.00895717	30.05275788						•						
cont	A	25860.00415	25922.63694	25834.87896	25813.2125	25801.30135	25762.53154	25743.71564	25731.55017	25709.68036	25703.8928	25691.4279												
rable 10 cont n-Heptane Data		101800	101800	101800	101800	101800	101800	101800	101800	101800	101800	101800												

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Table 11								
Methane Data								
P lab (Pa)	A	R		B	Tau (ms)	Vaporizer (C)	NOx (ppmV)	CO (ppmV)
99574	25128.00691	28.26512606	294.1575418	3458.581965	7.27	17.92	-	
99582		28.23264286	294.4959862	3489.773914	7.20	18.15	69.0	2701.35
99591	7	28.20476533	294.7870654	3466.798899	7.24	17.82	1.10	2270.14
99565	25090.3157	28.17940021	295.0524119	3507.523508	7.15	18.03	2.01	1800.16
99556	25078.38815	28.15542192	295.3036905	3486.52641	7.19	18.11	5.22	1632.89
99547	25066.57797	28.13378129	295.5308394	3476.669526	7.21	18.65	4.75	1517.79
99538	25052.09982	28.12361148	295.6377066	3427.166024	7.31	18.92	5.37	1517.15
99529	25043.00578	28.1087059	295.7944784	3385.46248	7.40	18.68	6.49	1535.12
99521	25034.4977	28.07888183	296.1086574	3374.070249	7.42	18.81	8.80	1642.21
99512	25032.84955	28.06094994	296.2978808	3419.56762	7.32	18.67	11.44	1775.02
99503	25024.45293	28,02985455	296.6265839	3438.292468	7.28	18.70	15.03	2114.79
99494	25014.78746	28,00577623	296.8816123	3416.48789	7.32	18.81	19.50	2461.38
99485	25004.37273	27.97372312	297.2217879	3372.030817	7.42	18.71	23.38	2718.44
99476	25002.68595	27.95483344	297.422627	3431.770842	7.29	18.68	28.72	3250.19
99468	24989.48486	27.91040984	297.8960198	3386.209378	7.38	18.72	39.52	4150.89
99459	24987.97784	27.88323553	298.1863418	3430.843443	7.28	18.51	43.29	4627.36
99450	24978.38371	27.87757746	298.246862	3367.215793	7.42	18.84	49.92	4879.25
100500	25487.03118	28.21808797	294.6478871	4206.943483	90.9	17.58	0.20	4309.36
100500	25468.32522	28.20572092	294.7770782	4198.81045	6.07	17.19	1.04	
100500	25427.87165	28.17110793	295.1392619	4173.680611	6.09	16.67		
100500	25431.75782	28.16116299	295.2434884	4222.828814	6.02	16.83	5.57	
100500	25393.70143	28.14967374	295.3639916	4051.582408	6.27	16.35	5.41	
100500	25385.14943	28.13500239	295.5180129	4033.589101	6.29	16.24	4.96	1923.68
100500	25369.98645	28.10354505	295.8487972	4016.859098	6.32	16.12	8.57	1849.92
100500	25354.59351	28.08557258	296.0381162	3949.612353	6.42	16.28	11.06	1862.91
100500	25338.90552	28.05168852	296.3957051	3900.353197	6.50	16.12	10.65	2002.02
100500	25325.14972	28.01500749	296.7837864	3888.280333	6.51	16.22	14.35	2349.18
100500	25320.87226	27.98528525	297.0989906	3925.161325	6.45	15.92		
100500	25308.06831	27.97119344	297.2486683	3823.159336	6.62	15.95	5 20.86	2822.67
100500	25308.91687	27.9480319	297.4950089	3909.246597	6.47	15.68	3 26.22	3347.07
100500	25306.98012	27.92906854	297.6970029	3951.65241	6.40	15.93	33.05	3936.19

	CO (ppmV)	3787.11	2738.56	2326.97	1967.86	1861.87	1832.05	1846.26	1867.53	1969.63	2240.32	2453.63	2651.61	3169.00	3524.66	3975.84	4385.07	4557.40	4857.79	4842.01	5015.93	
	NOx (ppmV)	T	0.00	0.00	90.0	0.23	0.38	1.51	3.71	4.39	66'9	14.56	20.67	26.80	32.81	39.48	51.58	56.43	09:59	82.99	76.30	
	Vaporizer (C)	.28	53.16	52.39	51.78	53.67	53.02	53.49	52.09	52.16	51.20	51.74	50.88	51.48	49.71	50.26	50.01	49.52	49.25	49.50	50.43	
	Tau (ms)	7.56	6.92	86.9	6.97	6.94	86.9	7.02	7.32	7.34	7.38	7.45	7.50	7.53	7.59	7.55	7.59	7.53	7.53	7.57	7.57	
	В	3321.402551	3733.785861	3702.029273	3705.569617	3718.163359	3697.368169	3673.028231	3516.433997	3510.036276	3488.321157	3453.0727	3427.803134	3417.117766	3388.648711	3403.508101	3386.211136	3414.410714	3412.047794	3394.756473	3393.129045	
		280.4432006	279.8723607	279.6097665	279.349416	279.1953563	279.0571758	278.8357284	278.6294306	278.4713039	278.1898104	277.9259684	277.7304223	277.3167787	277.1165711	276.8170803	276.600743	276.5541756	276.377819	276.2934864	276.1600396	
	R	29.64735811	29.70782816	29.73572814	29.76344149	29.77986493	29.794611	29.81827346	29.84035097	29.85729546	29.88750734	29.91588029	29.93694365	29.98159735	30.00325808	30.03571886	30.05921065	30.06427215	30.08345616	30.09263848	30.10717992	
	A	25112.7913	25838.3296	25824.15056	25810.20428	25802.09982	25794.11661	25784.76369	25755.44304	25749.5108	25740.23332	25731.06873	25724.4389	25717.85823	25712.57127	25710.60976	25705.45799	25706.42686	25702.35936	25699.32177	25696.34462	
Toluene Data	P lab (Pa)	99500	102300		102300		102300	102300	102300							102300		_		102300	102300	

cont	
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Tab1	

		(ppmV)	3203.87	2908.96	2727.07	2561.09	2429.33	2422.51	2439.58	2451.72	2547.48	2576.51	2824.71	3006.32	3170.79	3518.51	3835.20	4053.52	4321.15	4503.55	4821.70	4899.84							
		NOx (ppmV) CO	0.00	0.02	0.03	0.00	0.26	3.04	3.10	2.83	3.70	6.72	6.43	9.15	17.89	22.87	27.82	33.29	36.77	45.12	52.85	58.41							
			53.78	54.71	54.33	54.28	52.82	54.34	54.34	54.39	53.90	53.91	53.91	53.36	53.73	53.46	53.83	53.08	53.63	54.16	50.93	53.17							
		(ms) Vaporizer (C)	5.59	5.50	5.43	5.37	5.27	5.22	5.18	5.15	5.14	5.29	5.28	5.33	5.40	5.41	5.36	5.38	5.40	5.40	5.42	5.45		ļ					
		Tau (ms)	4650.185365	4729.490038	4790.504601	4842.719581	4931.238078	4982.994547	5016.867184	5046.315588	5056.611526	4908.035044	4913.19447	4861.712048	4798.046083	4785.21967	4828.678454	4814.612583	4790.36659	4792.982347	4772.494629	4739.921182							
		B	279,9911282	279.8167449	279.6853303	279.533633	279.2077003	279.0963324	278.9809784	278.8742921	278.6306087	278.4426591	278.1360395	277.9317624	277.7610204	277.4750637	277.1957714	276.9772132	276.7727286	276.6097879	276.4421224	276.2240962							
	Acceptance and the second seco	R	29.69522661	29.71373283	29.7276943	29.74382693	29.77854834	29.79043088	29.80274874	29.81415009	29.8402248	29.86036703	29.89328537	29.91525663	29.93364579	29.96449443	29.99468556	30.01835388	30.04053196	30.05822774	30.07645842	30.10019804							
اد		M	26005.78342	26006.0686	26006.28392	26006.53291	26003.33662	26003.51896	26003.7081	26007.62062	25989.48217	25953.17418	25939.70882	25922.61709	25906.03958	25894.66737	25890.18364	25880.88401	25871.5423	25865.52423	25857.88904	25847.5521							
Table 12 Colli	Toluene Data	P lab (Pa) A	102300 2600	102300 26	102300 260	102300 260	102300 260	102300 260	102300 26	102300 260	102300 259	102300 259	102300 259	102300 259	102300 259	102300 258	102300 258	102300 258	102300 25	102300 258	102300 258	102300 25							

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Ethylbenzene data	data							
P lab (Pa)	A	M	R	В	Tau (ms)	Vaporizer (C)	NOx (ppmV)	CO (ppmV)
99500	25105.78633	29.70579983	279.8914706	3364.232806	7.46	53.93		2695.95
100700	25411.39172	29.71937346	279.7636367	3463.669962	7.34	55.44		
100700	25401.61454	29.7330713	279.6347514	3437.568947	7.39	55.00	0.75	2149.83
99500		29.73600386	279.6071738	3406.923864	7.37	54.78	0.38	2053.52
99500	7	29.74337462	279.5378838	3447.34831	7.28	57.26	1.14	1925.28
100700		29.75484233	279.4301481	3476.881849	7.30	57.09	0.85	1858.60
100700		29.77522887	279.2388276	3467.289328	7.32	56.09	1.33	1720.18
99500		29.7772468	279.2199042	3415.895093	7.34	55.10	0.94	1705.42
100700	\rightarrow	29.79700392	279.0347655		7.37	55.97	3.17	1633.47
100700	7	29.80854461	278.9267343	3433.344882	7.39	55.02	3.66	1607.59
99500		29.81528183	278.8637064	3407.151592	7.36	54.61	2.92	1643.72
100700	_	29.84272391	278.6072754		7.42	56.59	3.81	1647.36
99500	7	29.85086492	278.5312928	3387.082549	7.40	54.84	4.92	1696.17
100700		29.86989759	278.3538168		7.46	55.43	7.92	1724.00
100700	25	29.87856041	278.2731124	3403.034485	7.45	60.12	5.79	1746.88
99500		29.89750589	278.0967761	3394.908792	7.38	54.87	9.05	1939.23
100700		29.90935292	277.9866225	3446.494061	7.35	55.57	10.51	1978.49
99500	- 1	29.92508967	277.8404373	3372.87231	7.42	54.91	12.42	2167.11
100700		29.94211137	277.6824886	3421.306085	7.40	54.89	13.59	2232.11
100700		29.96913811	277.4320693	3397.138672	7.45	55.23	15.93	2483.72
99500		29.97804876	277.3496056	3328.018918	7.52	53.92	17.52	2621.22
99500		29.98844693	277.2534376	3361.880996	7.44	54.10	21.97	2827.99
99500		29.99795448	277.1655649	3388.300702	7.38	53.92	24.15	2979.56
100700	7	30.02074036	276,955195	3307.474307	7.65	57.67	26.38	2986.08
100700		30.04847967	276.6995232	3375.479191	7.50	54.35	35.54	3581.27
100700		30.07084015	276.4937713	3333.884695	7.59	53.87	40.46	3834.20
99500	- 1	30.07497537	276.4557542	3330.719658	7.51	52.73	45.24	4127.74
100700		30.08307918	276.3812823	3375.121468	7.50	53.55	46.61	4156.90
99500	- 1	30.10300241	276.1983634	3325.918028	7.51	52.88	57.48	4712.86
100700	25290.37988	30.13281195	275.9251282	3342.293591	7.57	54.01	66.43	4865.59

		CO (ppmV)	2797.76	2747.30	2393.42	2330.68	2291.73	2333.83	2514.71	2744.10	3058.39	3481.95												
		NOx (ppmV) C	0.63	2.04	2.20	1.98	1.59	3.41	5.41	9.28	13.03	20.83												
		Vaporizer (C)	29.87	60.51	59.82	60.15	60.13	60.51	18.09	59.84	59.23	60.43	٠											
		Tau (ms)	5.49	5.45	5.42	5.32	5.28	5.24	5.24	5.29	5.31	5.29												
		В	4604.695129	4647.241478	4667.191112	4751.256643	4787.080599	4818.611587	4812.525519	4771.731234	4747.655633	4764.286255												
			279.698086	279.6107712	279.375757	279.1701033	278.8515391	278.5711023	278.2046608	277.9216374	277.6412167	277.2330753												
		R	29.72633857	29.73562129	29.76063524	29.78255874	29.81658279	29.84659906	29.88591196	29.91634649	29.94656233	29.99064953												
ont	ата	A	25300.43947	99500 25304.26495	25289.64123	99500 25289.90755	25272.21248	25259.58469	25238.79236	25220.46522	25204.05897	25185.29656												
Table 13 cont	Ethylbenzene data	P lab (Pa)	9500	99500	99500	99500	99500	99500	99500	99500	99500	99500												

Table 14

Cyclohexane data	lata							
P Lab (Pa)	A	M	R	В	Tau (ms)	Vaporizer (C)	NOx (ppmV)	CO (ppmV)
99700		29.62337352	280.6702617	3687.166894	6.83	51.45		2390.34
100850	- 1	29.58039048	281.0781016	3479.728456	7.32	53.63	0.71	4059.19
100866	- 1	29.59190438	280.968737	3530.266403	7.22	53.64		3166.24
100882		29.60241168	280.8690079	3524.302279	7.23	52.50	1.25	2609.32
100898		29.61819337	280.7193503	3540.359502	7.20	54.45	1.51	2038.94
100914	~	29.64003261	280.5125119	3503.171506	7.27	54.16	2.12	1498.88
100930		29.66227462	280.302172	3426.582018	7.42	53.57	2.82	1258.88
100945		29.67342043	280.196886	3425.326456	7.43	53.21	3.34	1205.55
100961		29.68695074	280.0691817	3363.637817	7.56	54.02	4.22	1142.68
100977		29.71031735	279.8489125	3329.552217	7.64	51.72	5.30	1152.38
100993	- 1	29.73977633	279.5717059	3309.158042	7.68	52.53	7.40	1245.18
101009	1	29.75483862	279.430183	3306.255257	7.69	51.05		1341.82
101025	_	29.7777087	279.2149902	3268.747618	77.7	51.37	10.71	1432.54
101041	25412.80807	29.81613501	278.8557268	3357.545284	7.57	50.72	15.34	1761.48
101057		29.83398698	278.6888661	3350.601061	7.58	50.48	19.00	1964.40
101073		29.8507837	278.5320508	3359.168185	7.56	51.90	23.67	2205.24
101089		29.87195861	278.3346117	3337.220359	7.61	51.07		2451.91
101105		29.88552111	278.2082993	3336.708739	7.62	50.85	31.27	2593.35
101120	7	29.90407612	278.0356754	3336.703187	7.62	51.70	37.94	2926.29
101136		29.92902771	277.8038793	3355.827137	7.57	50.37	44.53	3260.38
101152		29.9454958	277.651105	3394.452155	7.49	51.23	51.51	3570.52
101168		29.95436261	277.5689174	3403.426079	7.47	50.05	55.66	3720.54
101184	25	29.97116369	277.4133192	3403.317768	7.47	49.18	65.05	4056.10
101200	25415.476	30.00523321	277.0983295	3372.373211	7.54	49.14	78.88	4558.44

Table 14 cont

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P Lab (Pa)	A M	R	+	В	Tau (ms)	Vaporizer (C)	NOx (ppmV)	CO (ppmV)
99650	25306.16605	29.62119762	280.6908791	4410.866177	5.74	58.70		2294.02
99650	25312.18781	29.64984808	280.4196493	4594.900012	5.51	58.94		1965.70
05966	25314.53067	29.68264975	280.1097635	4741.146141	5.34	60.81		1887.72
99650	25315.11304	29.71782837	279.7781822	4785.740046	5.29	58.70		1947.55
99650	25315.81094	29.75989317	279.3827234	4964.829833	5.10	60.02		2234.50
99650	25289.50105	29.78536393	279.143811	4840,401566	5.22	58.46		2381.11
99650	25274.30054	29.83525142	278.6770549	4928.030793	5.13	57.70		2882.23
99650	25260.65807	29.84522532	278.5839245	4923.654577	5.13	57.98		3111.19
99650	25260.86944	29.85980225	278.4479257	5017.932271	5.03	59.18		3799.98
99650	25242.76014	29.89870699	278.0856042	4954.67311	5.09	58.31		4317.23
99650	25238.15251	29.92133909	277.875264	4980.045011	5.07	58.84		4511.63
99650	25228.53668	29.93007861	277.794125	4972.108375	5.07	57.86	10	4842.98
00650	25219 18475	29 96080789	277 5092057	4948.633179	5.10	60.49		5019.31
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Table 15

P lab (Pa)	A	M	R		В	Tau (ms)	Vaporizer (C)	NOx (ppmV)	CO (ppmV)
00/66	25232.53798	29.0008274		286.6952685	3631.261216	6.95	21.41		3885.96
100600	25432.60727	29.00122548		286.6913333	3489.665256	7.29	18.92	19.0	4064.27
100600		29.00203883		286.6832931	3551.376904	7.16	19.42	98.0	2625.57
100600	- 1	29.00383789		286.6655107	3580.959007	7.09	19.40		1763.12
100600	- 1	29.00530592		286.6510018	3594.144004	7.06	19.16		1309.97
100600	25367.05228	29.0061262		286.6428955	3545.034088	7.16	19.35	2.58	1143.07
100600	25352.68695	29.00690096		286.6352394	3488.5588	7.27	19.58		1059.75
100600	25336.71844	29.00880926		286.6163835	3452.989648	7.34	19.37	4.69	1036.89
100600	25324.56959	29.00960873		286.6084847	3419.630798	7.41	19.29		1067.22
100600	25317.88904	29.01121037		286.5926617	3436.085522	7.37	19.50		1202.57
100600	- 1	29.01162511		286.5885647	3410.90882	7.42	19.55	10.28	1263.62
100600	- 1	29.01311818		286.5738163	3455.289097	7.32	19.80	13.62	1495.76
100600	25302.24014	29.01357743		286.5692802	3437.164767	7.36	19.31	16.46	1648.48
100600	25302.57243	29.01452774		286.5598943	3495.784498	7.24	19.75	21.09	1930.94
100600	25294.91048	29.01548239		286.550466	3458.026836	7.31	19.64	24.60	2083.57
100600	25288.81272	29.0173192		286.5323272	3452.915115	7.32	19.57	31.10	2425.45
100600	25282.42749	29.01788688		286.5267218	3428.812009	7.37	19.72	36.74	2717.69
100600	25280.77672	29.01953689		286.5104303	3456.323572	7.31	19.83	44.05	3120.65
100600	25280.98252	29.02020747		286.5038098	3507.095427	7.21	19.75	53.14	3594.67
100600	25273.97261	29.02169713		286.4891038	3477.356336	7.27	19.96	63.06	4061.62
100600	25272.17449	29.02272489		286.4789586	3490.157476	7.24	19.88	71.24	4450.62

		NOx (ppmV)	3.36	0.87	1.75	1.34	1.38	2.64	3.60	6.25	8.35	98.6	10.97	15.11	19.61	24.59	34.02	47.71	64.29	72.65								
		Vaporizer (C) NO	222.75	202.19	203.35	204.38	208.20	209.39	211.48	211.70	211.80	211.34	212.43	210.71	208.55	205.72	205.11	207.10	206.12	208.70								
		Fuel Temp (C) Va	194.43	169.45	177.24	183.66	191.19	196.52	200.46	201.53	202.99	203.52	204.97	206.69	208.28	209.68	211.19	218.02	223.69	230.85								
		Tau (ms) F	8.31	7.97	7.76	7.56	7.63	7.63	7.51	7.43	7.38	7.50	7.62	7.63	79.7	7.75	7.78	7.58	7.65	7.57								
			3070.144258	3182.368665	3265.352458	3350.767258	3320.35476	3317.780234	3370.232664	3405.730356	3425.602948	3369.143098	3317.942246	3309.651251	3292.722672	3257.991311	3242.766988	3328.391336	3299.959972	3332.219568								
		B	280.6485094	280.6229412	280.3309951	279.840596	279.8811109	279.5147993	279.0569615	278.5761225	278.2513425	278.0758377	277.9522816	277.5483747	277.2343084	276.9545421	276.5289798	276.0950067	275.6466374	275.5023687								
		W.	29,62566956	29.62836881	29.6592248	29.7112003	29.70689938	29.74583106	29.79463388	29.8460612	29.88089806	29.89975709	29.91304821	29.95657968	29.99051614	30.02081113	30.06701145	30.11427153	30.16325568	30.17905087								
	t data	A	25522.43242	25353.35534	25350.78203	25343.10586	25335.19887	25322.63872	25312.82204	25301.80933	25294.68372	25284.4371	25275.25619	25266.52936	25259.17672	25250.87786	25242.96706	25243.07928	25235.21829	25235.25364								
Table 10	POSF 2926 Neat data	P Lab (Pa)	1100	1	100500	100500	100500	100500	100500	100500	100500	100500	100500	100500	100500	100500	100500	100500	100500	100500								

$ \omega \omega \omega \omega $	B Tau (ms) 3294.701551 7.71 3280.401506 7.70 3378.995073 7.47 3443.499054 7.32	R B Tau (ms) 279.9522917 3294.701551 7.71 279.6400239 3280.401506 7.70 279.4558763 3378.995073 7.47 279.2346562 3443.499054 7.32	M R Fau (ms) 29.69934609 279.9522917 3294.701551 7.71 29.73251069 279.4558763 3378.995073 7.47 29.75210294 279.4558763 3443.499054 7.32
3439.132431 7.31 3421.706676 7.34 3428.896624 7.32 3425.854344 7.32 3402.638692 7.37 3400.777405 7.42 3371.363557 7.47 3347.502242 7.47 3347.502242 7.47 3347.502382 7.53 3376.324449 7.42 3379.187639 7.38 3379.187639 7.38 3370.19593 7.40	3429.132431 3421.706676 3428.896624 3425.854344 3402.638692 3400.777405 3371.363557 3347.502242 3347.502242 3347.502242 3347.50242 3377.663282 3374.957561 3365.324449 3379.187639	277.996356 3421.706676 277.751082 3428.896624 277.5498241 3425.854344 277.5498241 3425.854344 277.3642397 3402.638692 277.0336015 3400.777405 276.7959147 3371.363557 276.3957147 3347.502242 276.0999368 3317.663282 275.5683992 3374.957561 275.3514973 3365.324449 275.3514973 3365.324449 275.3969488 3379.187639	29.90830571 27.096356 3421.3451 29.90830571 277.996356 3421.706676 29.93471687 277.51082 3428.896624 29.95642323 277.5498241 3425.854344 29.97646708 277.5498241 3425.854344 29.97646708 277.3642397 3402.638692 30.01224384 277.036015 3400.777405 30.08803986 276.7959147 3347.502242 30.13738 276.0999368 3317.663282 30.15456756 275.7260565 3386.357505 30.19558667 275.3514973 3365.324449 30.22352678 275.0969488 3379.187639 30.24888743 274.8663077 3370.19593
3378.995073 3443.499054 3455.26899 3476.772797 3500.682868 3489.990679 3439.132431 3425.854344 3425.854344 3402.638692 3400.777405 3371.363557 3377.502242 3377.502449 3379.187639 3379.187639		279.4558763 279.2346562 279.0624091 278.9046707 278.9046707 278.3684458 278.3684458 277.996356 277.751082 277.5498241 277.5498241 277.5498241 277.5498241 277.5683922 275.7260565 275.7260565 275.7260565 275.7260565 275.7260565 275.7260565	29.75210294 279.4558763 29.77567367 279.2346562 29.79405226 279.0624091 29.83583025 278.9046707 29.86832784 278.3684458 29.88307192 278.3684458 29.90830571 277.364237 29.97646708 277.751082 29.97646708 277.5498241 30.01224384 277.3642397 30.03801559 277.3642397 30.03801559 276.0999368 30.13456756 275.7260565 30.15456756 275.7260565 30.15488743 275.0969488 30.22352678 275.0969488 30.24888743 274.8663077
		R 279.9522917 279.6400239 279.2346562 279.0624091 278.9046707 278.9046707 278.6716485 278.3684458 278.3684458 277.996356 277.796351101 277.3642397 277.3642397 276.33514973 275.75683992 275.75683992 275.75683077	M BR 29.69934609 279.9522917 29.73251069 279.6400239 29.75210294 279.6400239 29.75210294 279.2346562 29.79405226 279.0624091 29.8109027 278.046707 29.88307192 278.3684458 29.88307192 278.3684458 29.98430571 277.51082 29.93471687 277.5498241 29.93471687 277.5498241 29.93471687 277.5498241 30.01224384 277.5498241 30.03801559 277.549834 30.137338 276.0399368 30.1137338 276.0399368 30.15456756 275.5683992 30.1718195 275.3514973 30.22352678 275.3514973 30.24888743 274.8663077

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Tablo	TODIC

	NOx	0.96	1 1.05	6 1.33	2 1.62	96.1	6 2.55	6 3.38	6 4.53	1 6.89	5 10.18	0 13.35	27.71							
	Vaporizer (C)	130.50	131.41	131.96	132.72	132.99	132.46	133.26	132.86	133.01	134.05	133.70		134.42						
	Fuel Temp (C)	192.25	196.93	198.78	199.45	199.83	199.12	200.65	204.11	215.67	220.12	223.35	10700	226.04	226.04 228.33	226.04 228.33 231.46	226.04 228.33 231.46 233.91	226.04 228.33 231.46 233.91 241.04	226.04 228.33 231.46 233.91 241.04 246.26	226.04 228.33 231.46 233.91 241.04 246.26 252.32
	Tau (ms)	6.58	6.25	6.10	5.97	5.90	5.74	2.60	5.47	5.31	5.13	5.16	1	5.11	5.11	5.11 5.12 5.09	5.11 5.12 5.09 5.09	5.11 5.12 5.09 5.09 5.09	5.11 5.12 5.09 5.09 5.09 5.13	5.11 5.12 5.09 5.09 5.09 5.13
	В	3861.021386	4061.966448	4164.613679	4255.475101	4298.534866	4419.911891	4535.740322	4642.685323	4777.269271	4945.536519	4913.071497	*********	4960.802203	4960.802203	4960.802203 4947.02589 4981.684054	4960.802203 4947.02589 4981.684054 4972.415712	4960.802203 4947.02589 4981.684054 4972.415712 4971.863141	4960.802203 4947.02589 4981.684054 4972.415712 4971.863141 4933.465543	4960.802203 4947.02589 4981.684054 4972.415712 4971.863141 4933.465543 4922.67188
		279.8996856	279.5583651	279.3158141	279.1635866	278.9379676	278.7776141	278.5518984	278.3276008	277.8323446	277.4508866	277.133407	1 1 1 1	276.7521805	276.7521805	276.7521805 276.4779795 276.2656792	276.7521805 276.4779795 276.2656792 276.1102678	276.7521805 276.4779795 276.2656792 276.1102678 275.7691073	276.7521805 276.4779795 276.2656792 276.1102678 275.7691073 275.5304226	276.7521805 276.4779795 276.2656792 276.1102678 275.7691073 275.5304226 275.3318375
	8	29.70492797	29.74119553	29.76702206	29.78325397	29.80734416	29.82448941	29.84865675	29.87271106	29.92596133	29.96710554	30.00143537		30.04276239	30.04276239	30.04276239 30.07255773 30.09566742	30.04276239 30.07255773 30.09566742 30.11260706	30.04276239 30.07255773 30.09566742 30.11260706 30.14986009	30.04276239 30.07255773 30.09566742 30.11260706 30.14986009 30.1759781	30.04276239 30.07255773 30.09566742 30.11260706 30.14986009 30.1759781
	M	25402.0307	25395.12601	25388.21214	25386.90471	25381.79388	25388.92141	25390.83787	25390.98813	25387.78847	25388.22014	25368.91688		25355.68597	25355.68597 25338.81561	25355.68597 25338.81561 25332.20614	25355.68597 25338.81561 25332.20614 25325.62617	25355.68597 25338.81561 25332.20614 25325.62617 25311.40475	25355.68597 25338.81561 25332.20614 25325.62617 25311.40475 25300.54087	25355.68597 25338.81561 25332.20614 25325.62617 25311.40475 25300.54087 25292.75592
Dodecane	P lab A	100000	100000	100000	100000	100000	100000	100000	100000	100000	100000	100000		100000	1 1					

APPENDIX B STEP SWIRL COMBUSTOR (SSC) (SELECTED DATA SET)

Table 1 Swirler Vane Angles and Swirler Vane Lengths for the SSC

Inner swirler (6 vanes)

Vane angle (degrees)	Direction	Length (mm)
30	clockwise	25
30	counter-clockwise	25
45	clockwise	19
45 _	counter-clockwise	19
. 60	clockwise	19
60	counter-clockwise	19

Outer swirler (12 vanes)

Vane angle (degrees)	Direction	Length (mm)
30	clockwise	32
45	clockwise	25
60	clockwise	25

Table 2 Flame Length Measurements in the SSC (stoichiometric conditions using propane fuel)

Vane angle combination (θ/θ_o) , degrees		Ai	_	combina ,, m/s	ition	
Co-swirl	16/8	32/8	48/8	16/16	32/16	48/16
30/30	150	127	162	66	86	122
45/30	56	81	111	71	76	117
60/30	66	86	127	71	91	152
30/60	51	127	193	41	56	76
45/60	35	56	71	41	46	51
60/60	25	71	132	46	51	61
Counter-swirl						
30/30	86	182	238	66	101	172
45/30	61	147	127	71	86	182
60/30	117	111	127	76	182	203
30/60	76	162	213	41	56	117
45/60	35	61	127	41	51	66
60/60	41	157	122	51	51	76

Table 3 Lean Blowouts (Equivalence Ratios) in the SSC (propane fuel)

Vane angle combination		Air	r velocity o		on	
(θ _i /θ _o), degrees			(U/U ₀), m/s		
Co-swirl	16/8	32/8	48/8	16/16	32/16	48/16
30/30	0.38	0.42	0.45	0.43	0.44	0.45
45/30	0.41	0.42	0.43	0.44	0.45	0.46
60/30	0.42	0.43	0.46	0.44	0.45	0.49
30/45	0.10	0.41	0.44	0.43	0.44	0.47
45/45	0.34	0.39	0.41	0.41	0.41	0.45
60/45	0.36	0.42	0.44	0.41	0.43	0.44
30/60	0.37	0.37	0.39	0.41	0.41	0.43
45/60	0.36	0.36	0.38	0.39	0.38	0.40
60/60	0.35	0.39	0.41	0.38	0.40	0.41
Counter-swirl						
30/30	0.29	0.42	0.46	0.41	0.46	0.46
45/30	0.44	0.43	0.44	0.43	0.49	0.47
60/30	0.45	0.42	0.45	0.43	0.49	0.50
30/45	0.10	0.43	0.46	0.44	0.43	0.48
60/45	0.36	0.43	0.46	0.42	0.43	0.44
30/60	0.17	0.41	0.44	0.39	0.41	0.46
45/60	0.36	0.42	0.43	0.41	0.41	0.44
60/60	0.35	0.41	0.42	0.39	0.41	0.43

Table 4 Rich Blowouts (Equivalence Ratios) in the SSC (propane fuel)

Vane angle combination (θ _t /θ _o), degrees		A	•	combinat J _o), m/s	ion	
Co-swirl	16/8	32/8	48/8	16/16	32/16	48/16
30/45	2.07	1.86	2.02	2.13	2.16	
45/45	1.98	1.91	1.79	2.07	2.07	1.97
60/45			1.70		2.02	
45/60	2.04	1.97		2.02	2.07	
Counter-swirl						
30/45	2.08	1.90	2.05			

Table 5 Test Conditions for the Swirl Combustor for PDF Model Validation

	LDA	
Annulus	Swirl Angle	U,
Air jet	45° swirl	100 m/s
Air jet	45° swirl	25 m/s
Air jet	60° swirl	25 m/s
Hydrogen jet	No swirl	25 m/s
Hydrogen jet	No swirl	100 m/s
Hydrogen jet	30° swirl	100 m/s
Hydrogen jet	45° swirl	100 m/s
	CARS	
Annulus	Swirl Angle	U _i
Hydrogen jet	No swirl	25 m/s
Hydrogen jet	No swirl	100 m/s
Hydrogen jet	30° swirl	100 m/s
Hydrogen jet	45° swirl	100 m/s

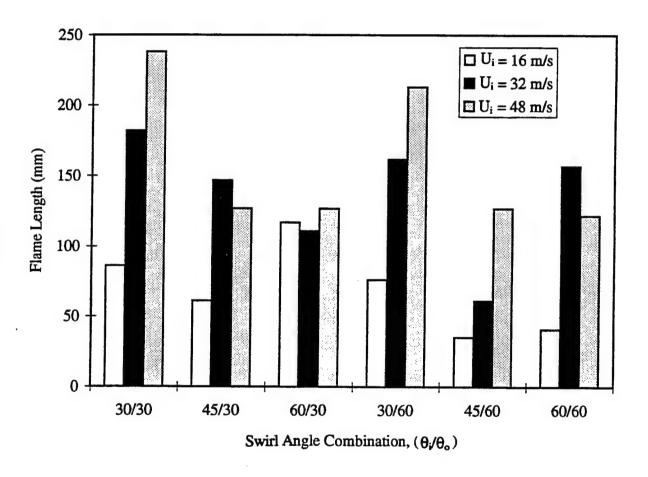


Figure 1 Variation of flame length with swirl angle combinations at three different values of inner air velocity ($U_o = 8$ m/s, counter-swirl, propane, stoichiometric conditions).

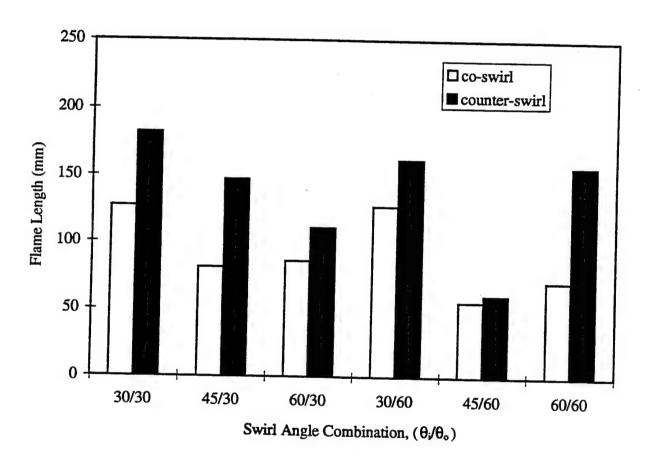


Figure 2 A comparison of flame lengths with co- and counter-swirl arrangements for a variety of swirl angle combinations ($U_i = 32 \text{ m/s}$, $U_o = 8 \text{ m/s}$, propane, stoichiometric conditions).

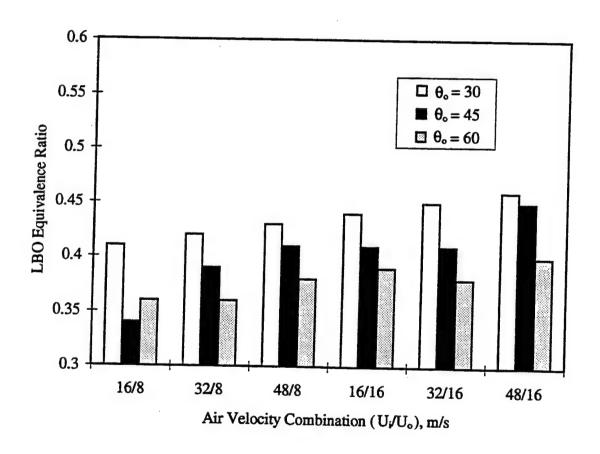


Figure 3 Effect of outer swirl angle on LBO for a variety of air velocity combinations $(\theta_i = 45^\circ$, co-swirl, propane).

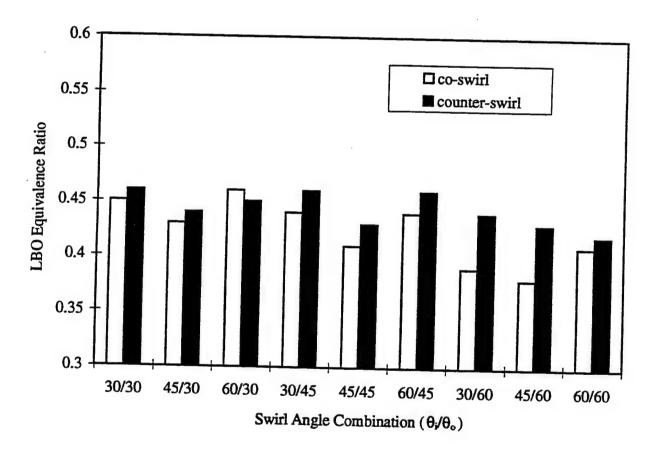


Figure 4 A comparison of LBO data for co- and counter-swirl arrangements for a variety of swirl angle combinations ($U_i = 48 \text{ m/s}$, $U_o = 8 \text{ m/s}$, propane).

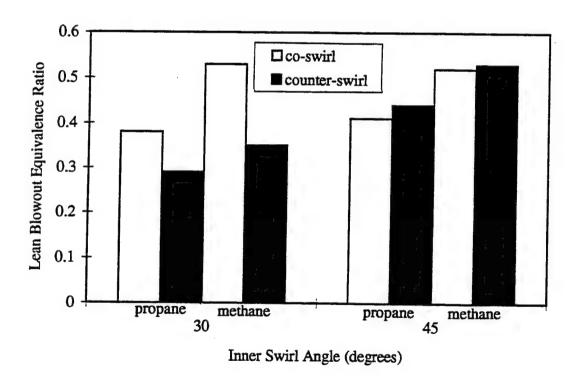


Figure 5 LBO data comparing inner swirl angle (θ_i), co-swirl and counter-swirl, and methane with propane ($\theta_o = 30^\circ$, $U_i = 14.4$ m/s, $U_o = 8.6$ m/s).

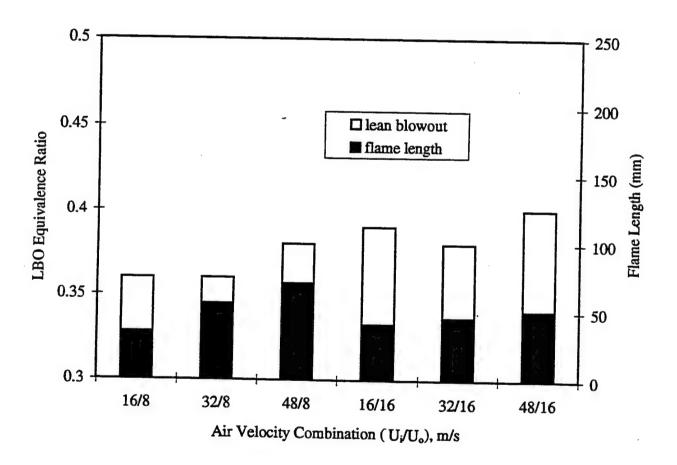


Figure 6 Variation of LBO and flame length with air velocity combinations for an optimum swirl angle configuration, $\theta_i = 45^{\circ}$, $\theta_o = 60^{\circ}$, co-swirl (propane, flame length at stoichiometric conditions).

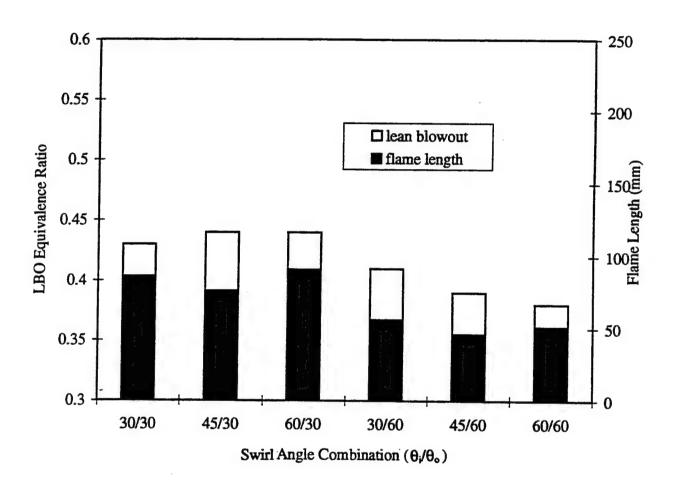


Figure 7 Variation of LBO and flame length with swirl angle combinations for an optimum air velocity split, $U_i = U_o = 16$ m/s (co-swirl, propane, flame length at stoichiometric conditions).

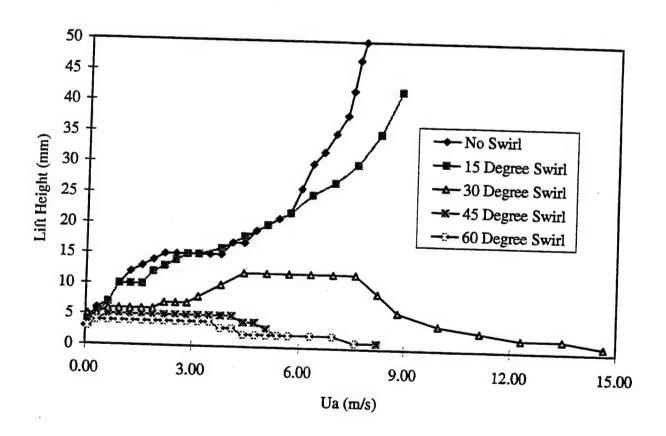


Figure 8 Lift heights at critical points in a double-concentric hydrogen-air jet diffusion flame for jet tube diameter of 2.39 mm for no swirl, 15°, 30°, 45°, and 60° swirl.

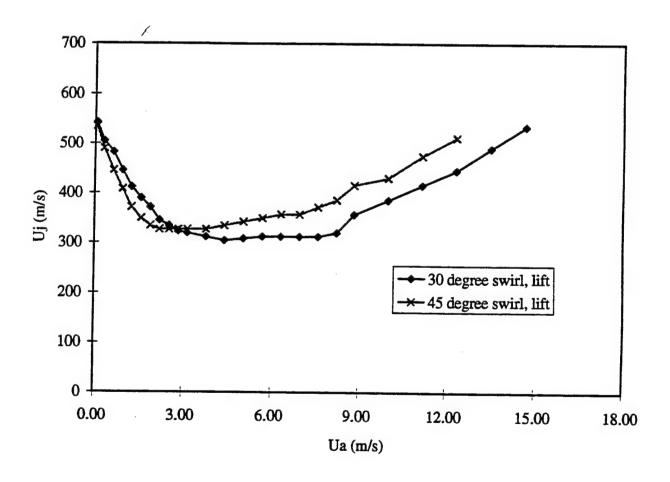


Figure 9 Stabilization effects of swirl in a double-concentric hydrogen-air jet diffusion flame for jet tube diameter of 2.39 mm.

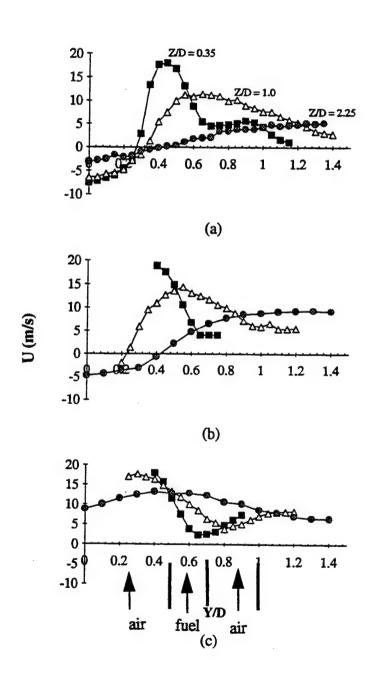


Figure 10a-c Radial variation of mean axial velocity at three different locations downstream of the fuel nozzle: (a) cold flow co-swirl, (b) hot flow co-swirl, (c) hot flow counter-swirl.

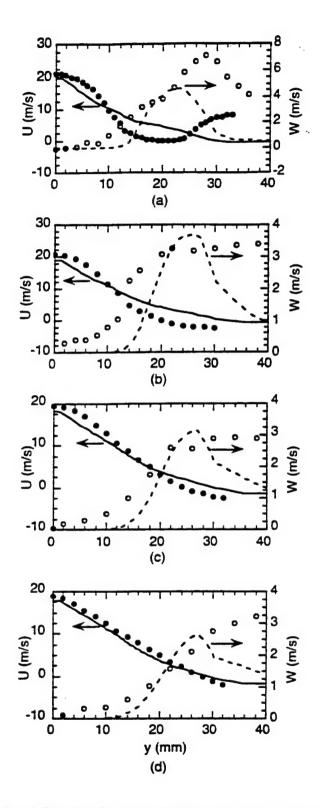


Figure 11 Calculated (lines) and measured (symbols) axial and swirl velocities for $\theta_i = 0^{\circ}$ case at axial locations (a) 20 mm, (b) 40 mm, (c) 60 mm, and (d) 80 mm.

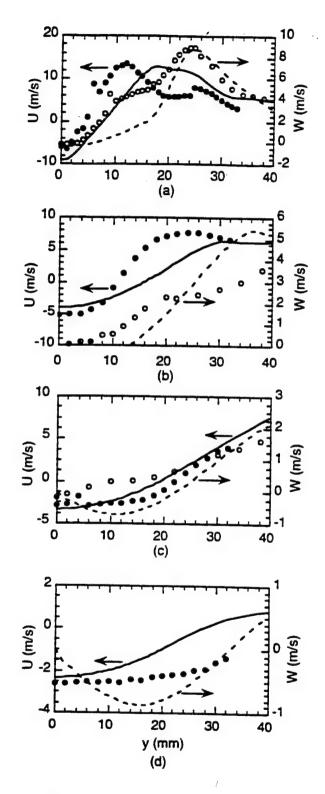


Figure 12. Calculated (lines) and measured (symbols) axial and swirl velocities for $\theta_i = 30^\circ$ case at axial locations (a) 20 mm, (b) 40 mm, (c) 60 mm, and (d) 80 mm.

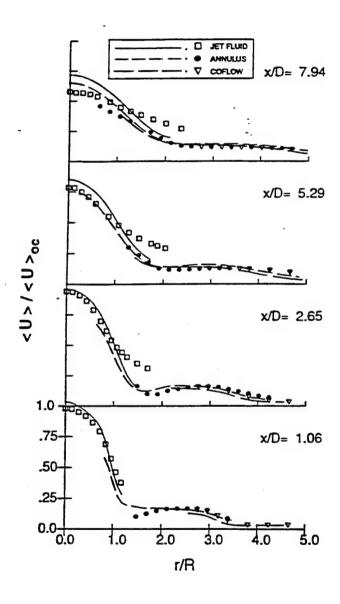


Figure 13 Radial profiles of computed conditional mean axial velocity (lines) compared against data (symbols) for the 30° swirl case.

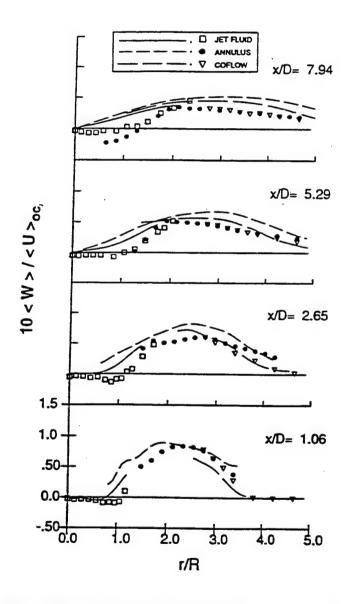


Figure 14 Radial profiles of computed conditional mean tangential velocity (lines) compared against data (symbols) for the 30° swirl case.

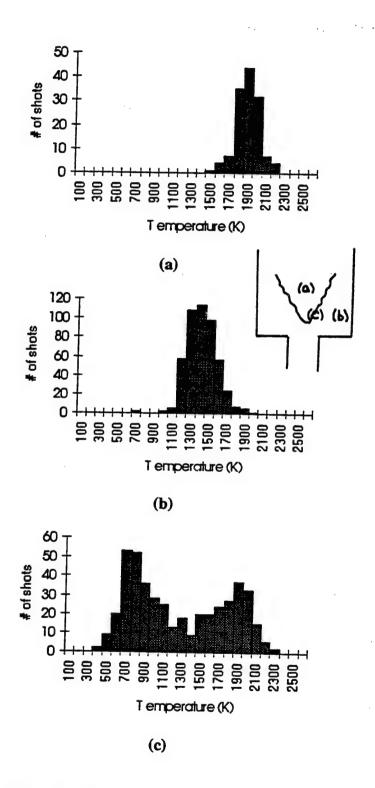


Figure 15a-c: PDF of CARS temperatures for (a) hot gas state, (b) intermediate gas state, and (c) bimodal gas state.

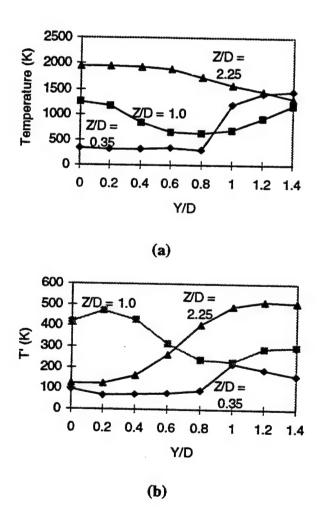
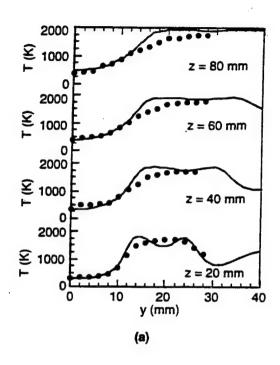


Figure 16a-b Radial variation of CARS (a) mean temperature and (b) rms temperature at three different downstream locations in the SSC.



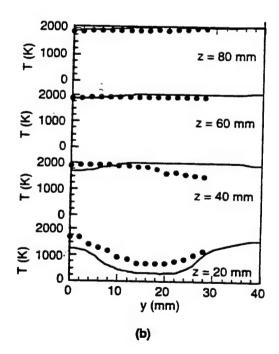


Figure 17a-b Radial temperature profiles at different axial locations for (a) $\theta_i = 0^\circ$, and (b) $\theta_i = 30^\circ$ co-swirl [calculated (lines), data (symbols)].

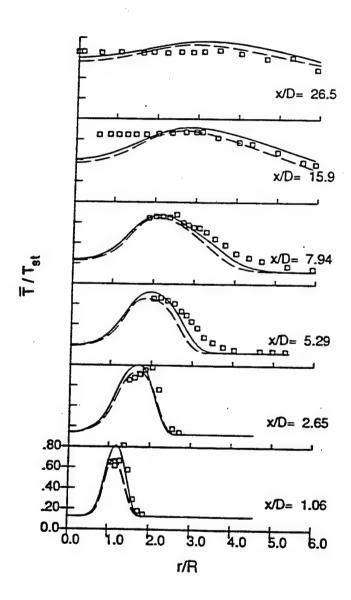


Figure ¹⁸ Computed radial profiles of Reynolds-averaged mean temperature with (solid lines) and without (dotted lines) the inclusion of molecular diffusion compared against CARS data (symbols) for the 30° swirl case.

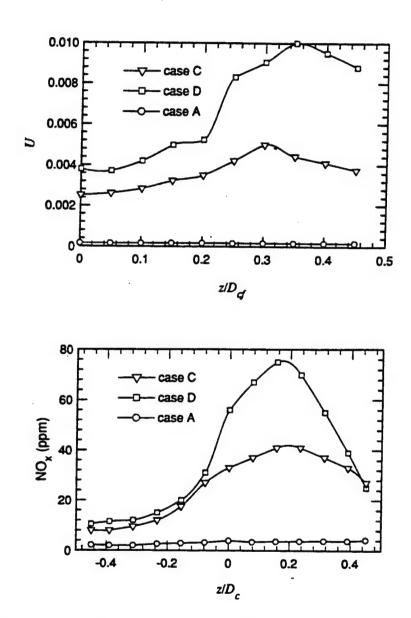


Figure 19 Profiles of unmixedness parameter U and corresponding profiles of NO_x emissions.

APPENDIX C SWIRLING JET DIFFUSION FLAME (SELECTED DATA SET)

Filename Format

The data set for the measurements of swirling and nonswirling turbulent hydrogen jet diffusion flames is stored in an electronic form (ASCII format) and available on request from Dr. F. Takahashi (e-mail: ftakahas@engr.udayton.edu). A brief description of the measurements is also available on the World Wide Web page (http://www.ca.sandia.gov/tdf/DataSums/TakahashH2.html). Each data file is headed with a FILENAME. The FILENAMEs have the following format for the velocity and temperature data: *JdtsVzzz.PPn* (upper case: letter, lower case: number). The definitions of these characters are listed below.

```
J: type of jet fluid
```

$$If J = A, \quad air \\ = H, \quad hydrogen$$

d: fuel tube diameter (d)

If
$$d = 9$$
, $d = 9.45 \text{ mm}$

t: fuel tube lip thickness (δ)

If
$$t = 0$$
, $\delta = 0.2 \text{ mm}$
= 1, $\delta = 1.2 \text{ mm}$

s: swirler helix angle (θ)

If
$$s = 0$$
, $\theta = 0$
= 1, $\theta = 15$
= 3, $\theta = 30$
= 4, $\theta = 45$
= 6, $\theta = 60$

V: average velocities at the jet exit plane

If
$$V = A$$
, $U_j = 100$, $U_a = 20$, $U_e = 4 \text{ m/s}$
= B, $U_i = 25$, $U_a = 4$, $U_e = 1 \text{ m/s}$

zzz: radial profile's axial position (x) or axial profile

If zzz = a number, the file is a radial profile at axial position zzz e.g., 001, x = 1.5 mm

010, x = 10 mm

025, x = 25 mm

050, x = 50 mm

075, x = 75 mm

150, x = 150 mm

225, x = 225 mm

= AX, the file is an axial profile along the jet centerline (y = 0).

PP: LDV particle seeding method.

If $PP = J_$, the velocity data with particles added to jet fluid only

= A_, the velocity data with particles added to annulus fluid only

= E_, the velocity data with particles added to external fluid only

= T, the temperature data

n: file ID number, 1 or 2.

If
$$n = 1$$
, the file includes $r, z, U, V, W, (u'), (v'), (w'), u'v', v'w', w'u'$
= 2, the file includes $r, z, u'^3, v'^3, w'^3, u'^2v', v'^2u', v'^2w', w'^2v', w'^2u', u'^2w', u'^4, v'^4, w'^4$

Table C1 Data Filenames and Test Conditions

Filename	Extension		θ	<i>U</i> j (m/s)	U _a (m/s)	U _e (m/s)	x (mm)	Seed	
H900B001	.J_1	.j_2	0°	25	4	1	1.5	Jet	
H900B001	.A_1	.A_2	0°	25	4	1	1.5	Annulus	
H900B001	.E_1	.E_2	0°	25	4	1	1.5	External	
H900B010	.J_1	.j_2	0°	25	4	1	10	Jet	
H900B010	.A_1	.A_2	0°	25	4	1	10	Annulus	
H900B010	.E_1	.E_2	0°	25	4	1	10	External	
H900B025	.J_1	.j_2	0°	25	4	1	25	Jet	
H900B025	.A_1	.A_2	0°	25	4	1	25	Annulus	
H900B025	.E_1	.E_2	0°	25	· 4	1	25	External	
H900B050	.J_1	.j_2	0°	25	4	1	50	Jet	
H900B050	.A_1	.A_2	0°	25	4	1	50	Annulus	
H900B050	.E_1	.E_2	0°	25	4	1	50	External	
H900B075	.J_1	.j_2	0°	25	4	1	75	Jet	
H900B075	.A_1	.A_2	0°	25	4	1	75	Annulus	
H900B075	.E_1	.E_2	0°	25	4	1	75	External	
H900B150	.J_1	.j_2	0°	25	4	1	150	Jet	
H900B150	.A_1	.A_2	0°	25	4	1	150	Annulus	
H900B150	.E_1	.E_2	0°	25	4	1	150	External	
H900B225	.J_1	.j_2	0°	25	4	1	225	Jet	
H900B225	.A_1	.A_2	0°	25	4	1	225	Annulus	
H900B225	.E_1	.E_2	0°	25	4	1	225	External	
H900BAX	J_1	.j_2	0°	25	4	1	1.5-225	Jet	
H910A001 H910A001 H910A001	.J_1 .A_1 .E_1	.j_2 .A_2 .E_2	0° 0° .0°	100 100 100	20 20 20	4 4 4	1.5 1.5 1.5	Jet Annulus External	

H910A010	.J_1	.j_2	0°	100	20	4	10	Jet
H910A010	.A_1	.A_2	0°	100	20	4	10	Annulus
H910A010	.E_1	.E_2	0°	100	20	4	10	External
H910A025	.J_1	.j_2	0°	100	20	4	25	Jet
H910A025	.A_1	.A_2	0°	100	20	4	25	Annulus
H910A025	.E_1	.E_2	0°	100	20	4	25	External
H910A050	.J_1	i 2	0°	100	20	4	50	Jet
H910A050	.A_1	.j_2 .A_2	0°	100	20	4	50	Annulus
H910A050	.E_1	.E_2	0°	100	20	4	50	External
H910A030	. <u>D_1</u> .J_1	.b_2 .j_2	0°	100	20	4	75	Jet
H910A075		.A_2	0°	100	20	4	75	Annulus
	.A_1	.A_2 .E_2	0°	100	20	4	75 75	External
H910A075	.E_1	.E_2		100	20	4	150	Jet
H910A150	.J_1	.j_2 .A_2	0°	100	20	4	150	Annulus
H910A150	.A_1	.A_2	0°		20	4	150	External
H910A150	.E_1	.E_2	0°	100				
H910A225	.J_1	.j_2 .A_2	0°	100	20	4	225	Jet
H910A225	.A_1	.A_2	0°	100	20	4	225	Annulus
H910A225	.E_1	.E_2	0°	100	20	4	225	External
H910AAX	.J_1	.j_2	0°	100	20	4	1.5-225	Jet
H903A001	.J_1	.j_2	30°	100	20	4	1.5	Jet
H903A001	.A_1	.A_2	30°	100	20	4	1.5	Annulus
H903A001	.E_1	.E_2	30°	100	20	4	1.5	External
H903A010	.J_1	.i 2	30°	100	20	4	10	Jet
H903A010	.A_1	.j_2 .A_2	30°	100	20	4	10	Annulus
H903A010	.E_1	.E_2	30°	100	20	4	10	External
H903A025	.J_1	i 2	30°	100	20	4	25	Jet
H903A025	.a_1 .A_1	.j_2 .A_2	30°	100	20	4	25	Annulus
H903A025	.E_1	.E_2	30°	100	20	4	25	External
H903A023	.L_1 .J_1	.L_2 ; 2	30°	100	20	4	50	Jet
H903A050	.A_1	.j_2 .A_2	30°	100	20	4	50	Annulus
		.A_2 .E_2	30°	100	20	4	50	External
H903A050	.E_1	.E_2 ; 2		100	20	4	75	Jet
H903A075	.J_1	.j_2 .A_2	30°	100	20	4	75 75	Annulus
H903A075	.A_1	.A_2	30°		20		75 75	External
H903A075	.E_1	.E_2	30°	100		4		Jet
H903A150	.J_1	.j_2	30°	100	20	4	150	
H903A150	.A_1	.A_2	30°	100	20	4	150	Annulus
H903A150	.E_1	.E_2	30°	100	20	4	150	External
H903A225	.J_1	.j_2	30°	100	20	4	225	Jet
H903A225	.A_1	.A_2	30°	100	20	4	225	Annulus
H903A225	.E_1	.E_2	30°	100	20	4	225	External
H903AAX	.J_1	.j_2	30°	100	20	4	1.5-225	Jet
H904A001	. J _1	.j_2	45°	100	20	4	1.5	Jet
H904A001	.A_1	.A_2	45°	100	20	4	1.5	Annulus
H904A001	.E_1	.E_2	45°	100	20	4	1.5	External
H904A010	.J_1	.j_2	45°	100	20	4	10	Jet
H904A010	.A_1	.A_2	45°	100	20	4	10	Annulus
H904A010	.E_1	.E_2	45°	100	20	4	10	External
H904A010	.E_1 .J_1	.b_2 .j_2	45°	100	20	4	25	Jet
H904A025	_	.J_2 .A_2	45°	100	20	4	25	Annulus
	.A_1	.A_2 .E_2	45°	100	20	4	25	External
H904A025	.E_1			100	20	4	50	Jet
H904A050	. J _1	.j_2	45°	100	20	4	50	300

H904A050 H904A075 H904A075 H904A075 H904A150 H904A150 H904A150 H904A225 H904A225 H904A225	.A_1 .E_1 .J_1 .A_1 .E_1 .J_1 .A_1 .E_1 .J_1 .A_1 .E_1 .J_1 .A_1 .I_1 .I_1 .I_1 .I_1 .I_1	.A_2 .E_2 .j_2 .A_2 .E_2 .j_2 .A_2 .E_2 .j_2 .A_2 .E_2 .j_2	45° 45° 45° 45° 45° 45° 45° 45° 45° 45°	100 100 100 100 100 100 100 100 100 100	20 20 20 20 20 20 20 20 20 20 20 20	4 4 4 4 4 4 4 4 4	50 50 75 75 75 150 150 225 225 225 1.5-225	Annulus External Jet Annulus External Jet Annulus External Jet Annulus External Jet Annulus
H900B001	Τ.		0°	25	4	1	1.5	
H900B010	Γ.		0°	25	4	1	10	
H900B025	Γ.		0°	25	4	1	25	
H900B050	Γ.		0°	25	4	1	50	
H900B075	Τ.		0°	25	4	1	75	
H900B150	.T		0°	25	4	1	150	
H900B225	.T		0°	25	4	1	225	
H910A001	.T		0°	100	20	4	1.5	
H910A010	.T		0°	100	20	4	10	
H910A025	.T		0°	100	20	4	25	
H910A050	Т.		0°	100	20	4	50	
H910A075	Τ.		0°	100	20	4	75	
H910A150	Τ.		0°	100	20	4	150	
H910A225	Т.		0°	100	20	4	225	
H903A001	.T	•	30°	100	20	4	1.5	
H903A010	T.		30°	100	20	4	10	
H903A025	.T		30°	100	20	4	25	
H903A050	.T		30°	100	20	4	50	
H903A075	.T		30°	100	20	4	75	
H903A150	.T		30°	100	20	4	150	
H903A225	T.		30°	100	20	4	225	
H904A001	.T		45°	100	20	4	1.5	
H904A010	.T		45°	100	20	4	10	
H904A025	.T		45°	100	20	4	25	
H904A050	T.		45°	100	20	4	50	
H904A075	.T.		45°	100	20	4	75	
H904A150	.T.		45°	100	20	4	150	
H904A225	.T		45°	100	20	4	225	

Listings of Selected Data Files

```
C FILENAME= H910A001.J 1
C H2 FLAME; d=9.45, d=1.2 \text{ mm}; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 \text{ mm}
C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894
  12 : No. of data points
                                       SIG(u') SIG(v') SIG(w')
                                                                u'v'
                                                                         v'w'
                                                                                w'11 1
                                 W
                U
        x
                               1.354 13.526 10.069
                                                       7.087
                                                              10.490
                                                                         .153
                                                                               -2.223
  4.70
        1.50 45.245
                       2.211
                                                               47.540 -1.563 -7.021
                               .395 17.458 11.805
                                                       6.816
  4.49
        1.50 63.038
                       2.455
                      2.179
                               -.096 17.541 12.350
        1.50 80.244
                                                       6.816
                                                              47.120 -1.605 -9.640
  4.30
                                                              51.473 -1.320 -2.454
                       .840
                                                       7.254
        1.50 96.715
                              .176 13.925 9.812
  4.00
                        .814
                                .197 11.118 8.132
.203 9.677 7.320
                                                       7.339
                                                               38.856
                                                                         .604 -2.605
        1.50 106.534
  3.51
                                                              30.055
                                                                        1.084
                                                                                . 930
                                                       7.056
        1.50 113.880
                        .744
                                .203
  3.01
                                .195
                        .475
                                      8.805 6.710 6.718
                                                              25.411 -1.126 -1.752
  2.51
        1.50 119.246
                                                              21.539
                                .172
                                      8.134 6.318
                                                       6.102
                                                                       -.772 -3.260
        1.50 123.636
                        .288
  2.00
                        .379
                                                       5.532
                                                               13.717
                                                                         .366
                                                                               -.917
        1.50 127.633
                                .039
                                       7.359
                                               5.757
  1 51
                                       6.719 5.313 5.073
                                                               11.360
                                                                        -.199 ~1.974
        1.50 130.283
                        .008
                                .051
  1.01
                                      6.045 4.968 4.742
                                                                4.832
                                                                        .979
                                                                               -.639
        1.50 132.161
                        .143
                                .020
  .51
                                                                 .599
                                                                         .092
                                                                               -.288
                        .003
                                .004
                                       5.843 4.906 4.395
       1.50 132.947
C FILENAME= H910A010.J 1
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm
  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
  D090894
C 10 : No. of data points
                                       SIG(u') SIG(v') SIG(w') u'v'
                                                                         77 1 Ta7 1
Су
                                W
         х
                U
                              1.981 13.384 10.200 11.936 89.749 -2.888 -2.301
  5.50 10.00 47.798
                       7.061
  5.00 10.00 60.681 6.716 1.777 15.929 11.585 13.037 110.695
                                                                       -.502
                                                                                . 647
                             2.037
  4.51 10.00 75.968 5.069
4.01 10.00 92.260 1.501
                               2.037 17.337 12.785 12.997
1.403 16.730 12.002 12.086
                                                              114.151 -4.634 -11.047
                                                              93.429 -2.484 -4.355
  3.41 10.00 106.451 -.638 1.210 13.453 9.703 9.706
                                                              57.647 -1.097 -1.549
                                                              28.801
                      -.472 .488 10.257
                                               7.556
                                                       7,464
                                                                       -.119 -3.538
  2.70
        9.99 116.605
                                      8.545 6.103
       10.00 123.160
                                                                         .311 -2.087
                       -.297
                                .452
                                                       6.080
                                                               18.917
  2.01
                                                              12.029
                                .185
                      -.322
                                      7.181 5.350
                                                       5.233
                                                                        -.885 -1.406
  1.30 10.00 128.239
                                      6.537
                                .058
                                                      4.765
4.615
                                                                5.680
                                                                         .235
                                                                               -.158
  .62 10.00 130.866 -.201
                                               5.090
                                              5.018
                                                                               -.729
                                                                         .353
   .01 10.00 131.208
                      -.302
                                .101
                                      6.306
                                                                -.323
C FILENAME= H910A025.J 1
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm
  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
С
  D090894
C 12 : No. of data points
                                                                         v'w'
                                W
                                       SIG(u') SIG(v') SIG(w') u'v'
                                                                                w'u'
                U
         ×
                                                              43.624
67.799
                                .548 10.343
                                               7.167
                                                      8.780
                                                                         .584
                                                                                2.826
  7.00 25.00 40.000
                      4.442
       25.00 51.245
                      4.184
                               1.351 12.630
                                               9.113 11.048
                                                                         .045
                                                                                3.467
  6.01
                      4.699 1.655 14.016 10.557 12.120
                                                              87.083 -3.623 -1.355
  5.51
       25.00 59.076
 5.01 25.00 66.806 4.388 2.069 15.379 11.444 12.835 101.362 .984 -.644
4.50 25.00 76.153 4.399 2.178 17.038 12.361 13.440 111.294 -5.517 -7.605
4.01 25.00 86.412 3.276 1.641 17.457 12.691 13.049 111.088 1.904 -3.777
       25.00 98.616 1.749 1.300 16.298 11.842 11.973
25.00 111.837 1.002 1.176 14.283 10.365 10.106
                                                              92.842
                                                                       -.232 -6.712
  3.41
                                                               70.032
                                                                        1.265
                                                                               -4.581
  2.70 25.00 111.837
                                .403 10.964
                                              8.316 8.146
                                                              34.493
                                                                         .419 -3.889
       25.00 121.454
                       -.143
  2.01
                                .268
                                      8.669
                                               6.679
                                                       6.466
                                                              16.780
                                                                         .420
                                                                               -.481
  1.29 25.00 127.682
                       -.291
                                       7.772 5.805
7.129 5.582
                                .376
                                                       5.487
                                                                7.021
                                                                         .140 -1.086
                       -.157
  .62 25.00 130.651
                                                      5.218
                                                                        1.606 -1.668
                              -.049
                                       7.129
   .01 25.00 131.472
                       -.229
                                                                -.233
C FILENAME= H910A050.J 1
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm
C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894
  11 : No. of data points
                                 W
                                       SIG(u') SIG(v') SIG(w')
                                                                 u'v'
                         V
         x
                TT
                                                                        .917 -1.676
                                                       7.484 27.519
  8.80 49.99 35.764
                       3.672
                                .642 8.774 5.877
                      3.675
3.749
                                .644
  8.22 49.99 40.069
                                       9.489
                                               6.538
                                                       8.318
                                                               32.578
                                                                         .866
                                                              50.565 -1.965 -1.294
                                .759 11.372 8.137 10.209
  7.01 49.99 49.646
```

```
6.00 49.99 57.945 3.504 1.738 13.140 9.482 11.903
                                                                    67.875 -2.190
                                                                                      -.967
   5.01 49.99 67.518 3.189
                                 1.531 15.356 11.025 12.605
                                                                     90.926 -1.579 -7.205
                         2.831
                                 1.696 16.747 11.750 12.902
1.235 16.185 11.578 11.828
.935 15.758 11.535 11.014
   4.00 49.99 79.731
                                                                     99.144 1.587 -5.555
   2.72 49.99 97.285
                          1.985
                                                                     84.821
                                                                              2.192 -7.972
   2.00 49.99 106.157
                          .929
                                                                     79.219
                                                                              -.367 -9.674
   1.30 49.99 113.972
                          .405
                                                                     46.716 1.479 -8.504
                                   .589 14.018 10.367 9.708
                                   .331 11.742
.511 11.439
    .60 49.99 119.552
                           .511
                                                  9.734 8.746
9.462 8.816
                                                                     17.026 1.492 -6.419
    .00 49.99 120.325
                         - . 367
                                                                     -4.297
                                                                              .136 -4.541
C FILENAME= H910A075.J 1
C H2 FLAME; d=9.45, d=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm
C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
   D090894
C 12 : No. of data points
                  U
                         V
                                    W
                                           SIG(u') SIG(v') SIG(w') u'v'
                                                                               v'w'
                                                                                       w'u'
 11.00 75.00 33.019 3.721
9.49 75.00 40.316 3.475
8.23 75.00 47.728 3.742
                                  .110 8.148 4.949 7.151 21.340 1.071 .546 8.839 6.065 8.634 25.152 .569
                                                                                      - 669
                                  .546
                                                  6.065 8.634
7.447 9.660
                                                                     25.152
                                                                             .569
                                                                                       .101
                                    .499 10.271
                                                                     37.627
                                                                               .411
                                                                                       -.873
  7.01 75.00 54.961 3.849 1.207 11.694 8.535 10.839 49.695 1.922
                                                                                        . 478

    5.99
    75.00
    60.155
    3.343
    1.202
    12.798
    9.693
    11.411

    5.00
    75.00
    68.076
    3.083
    1.223
    13.815
    10.532
    11.809

    3.99
    75.00
    75.808
    2.899
    1.430
    14.925
    11.181
    12.060

    2.72
    75.00
    87.425
    1.793
    1.160
    15.575
    11.293
    11.613

                                                                     63.522 -1.228 -6.162
                                                                     68.806 -2.526 -8.012
                                                                     74.422 2.027 -5.927
66.776 - 755 -7.665
                                                                     66.776
                                                                              -.755 -7.665
  2.00
                         1.393 1.240 14.995 11.540 10.996
        75.00 93.184
                                                                     55.989
                                                                            5.786 -8.213
                                                                             .838 -3.772
  1.30 75.00 97.597
                                 .970 14.566 11.448 10.493 33.976 .838 -3.772
.991 13.889 11.213 10.119 13.381 1.639 -8.131
.784 13.714 11.004 10.073 -4.609 3.454 -9.884
                          1.059
   .61 75.00 100.550
                          .399
   .00 75.00 100.847
                          .110
C FILENAME= H910A150.J 1
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm
  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894
C 15 : No. of data points
                                           SIG(u') SIG(v') SIG(w') u'v'
         x
                  U
                           V
                                    W
                                                                              v'w'
                                                                                        w'u'
 16.00 150.00 32.543
                                   .375
                                           7.119 4.563 6.875 14.028
7.889 5.235 7.556 17.348
                          3.628
                                                                              -.479
                                                                                        . 519
 13.99 150.00 36.672 4.016
                        3.640
                                   .237
                                          7.889
                                                                               .395
                                                                                       1.720
 11.99 150.00 40.661
                                   .259
                                          8.526
                                                  5.836 7.958 23.405
                                                                            1.151
                                                                                       1.320
 10.00 150.00 45.669
                                                  6.268 8.111
6.676 8.427
                          3.288
                                   .876
                                          8.844
                                                                    23.247
                                                                              .715 -2.045
                                .192
                        3.080
  9.00 150.00 47.279
                                          9.249
                                                                    27.511
                                                                              -.012 -1.994
  8.01 150.00 50.193
                         3.072
                                 .416
                                                  6.724 8.501 27.153
7.003 8.523 29.648
7.178 8.550 25.921
                                         9.224
                                                                               . 933
                                                                                      .124
  7.01 150.00 52.207
                          2.705
                                   .302
                                           9.856
                                                                    29.648 1.327
                                                                                      -.744
  5.99 150.00 54.615
                                   .132 9.749
                         2.273
                                                                              3.413 -2.951
                         1.819
  5.00 150.00 56.927
                                 .503 10.216
                                                   7.325
                                                          8.210
                                                                             3.495 -1.077
                                                                    26.735
  3.99 150.00 59.859
                                                   7.212 8.227
7.223 8.020
                         1.612
                                   .490
                                          9.411
                                                                             -.953 -3.899
-.170 -6.716
                                                                    19.625
  3.00 150.00 61.912
                                         9.457
                         1.469
                                   .411
                                                                    18.576
  2.01 150.00 63.611
                          .966
                                 .234 9.647
                                                          7.639 10.186
                                                   7.415
                                                                             1.037 -4.116
  1.01 150.00 64.592
                                   .660
                          .435
                                           9.573
                                                   7.286
                                                          7.784
                                                                   5.116 2.119 -5.857
   .51 150.00 65.262
                                                                             -.190 -3.387
                          .157
                                   .301
                                          9.209
                                                   7.265
                                                            7.597
                                                                     2.818
   .00 150.00 64.906
                                                          7.717
                         -.029
                                   .311 9.579
                                                  7.443
                                                                      . 603
                                                                              .391 -5.104
C FILENAME= H910A225.J 1
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm
C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894
C 13 : No. of data points
         x
                 Ü
                                   W
                                          SIG(u') SIG(v') SIG(w') u'v'
                                                          5.630
                                                                            V'W'
 24.00 225.00 26.731
                                                                            .275
                                         5.428
                         3.348
                                 .200
                                                   3.576
                                                                    8.537
                                                                                        .671
 21.99 224.99 28.699 3.500
                                .252 5.915
                                                            5.915 10.124
 20.00 224.99 30.875
                                                   3.896
                                                                              .400
                         3.500
                                 .060 6.131 4.274
                                                                              .225 -1.317
                                                            6.285 10.947
 18.00 224.99 32.601
                         3.266
                                  .198
                                                          6.123 12.208
6.325 12.465
                                          6.734
                                                   4.421
                                                                               .169
                                          6.877
 15.99 224.99 35.026
                        3.167
                                 -.034
                                                   4.606
                                                                             1.387
                                                                                       .480
 13.99 224.99 37.397 2.925
                                 -.250
                                                          6.372 11.581
                                         6.950
                                                  4.645
                                                                              .926
                                                                                     -.615
 11.99 224.99 40.639
                         2.459
                                 -.054
                                                   5.470
                                          7.570
                                                          7.293
                                                                   15.476
                                                                              -.862
                                                                                     -.386
10.00 224.99 43.182
                         2.619
                                 -.035
                                          6.908
                                                                  11.437
11.443
                                                   4.983
                                                           6.149
                                                                              .231 -1.101
                                 -.037 6.865
  8.00 224.99 45.480 2.312
                                                           6.277
                                                   5.184
                                                                               .578 -1.480
 5.99 224.99 46.637
3.98 224.99 48.849
                         1.601
                                 -.228 7.002
                                                   5.207
                                                                            1.569 -1.753
                                                           6.178
                                                                   9.452
                         1.329
                                 -.153
                                          6.813
                                                   5.150
                                                            6.019
                                                                   6.286
                                                                            -.072 -1.666
                                         6.725
  2.00 224.99 49.905
                         . 623
                                  .090
                                                   5.239
                                                           5.827
                                                                     3.885
                                                                             .115 -2.420
```

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.129 -1.440
   .01 224.99 50.004 -.084 -.153 6.906 5.086 5.658
                                                             .566
C FILENAME= H910A001.A 1
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm
 LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C 11 : No. of data points
                                     SIG(u') SIG(v') SIG(w') u'v'
                                                                     v'w'
                               W
        x
               Ħ
                       V
                                                                    .161
                                                                           - 187
                      1.614
                              .659
                                                            4.899
       1.50 13.952
                                   3.432 2.886 2.678
 13.50
                     .577
                              .520
                                    2.961
       1.50 17.695
                                            2.109
                                                    2.268
                                                            2.660
                                                                     .182
                                                                           - 148
 13.00
                                                            1.406
                                                                           -.125
                                                                     .143
        1.50 19.672
                       .193
                              .528
                                             1.631
                                                    1.879
 12.49
                       .127
                              .577
                                                           1.048
                                                                     .071
                                                                           -.275
        1.50 21.022
                                    2.146
                                           1.372
                                                    1.639
 12.00
                                                           .660
                              .664
                                    1.766
                                           1.194
                                                                     .038
                                                                           -.107
                       .149
                                                    1.432
       1.50 22.600
 11.19
                                     1.474
                       .088
                              .589
                                            1.059
                                                    1.255
                                                             .304
                                                                    -.034
                                                                           -.181
 10.40
        1.50 23.346
                       .071
                              .478
                                             .997
                                                    1.186
                                                            -.084
                                                                    -.056
                                                                           -.137
                                    1.326
 9.60
        1.50 23.493
                     -.058
                              .295
                                    1.586
                                            1.097
                                                    1.319
                                                            -.587
                                                                    -.057
                                                                           -.135
 8.20
       1.50 22.706
                                            1.338
                              .099
             20.177
                      - . 265
                                     2.184
                                                    1.663
                                                           -1.358
                                                                    -.025
                                                                           -.168
  6.99
        1.49
                     -.697
                                                                           -.178
                             -.037
                                     3.190
                                                    1.742
                                                           -1.934
                                                                    .000
  6.01
        1.50
             15.249
              7.597 -2.581 -.082
                                    2.005 1.066 1.417
       1.50
                                                            -.617
                                                                    -.004
                                                                           .045
 5.51
C FILENAME= H910A010.A 1
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
 9 : No. of data points
                                                                            w'u'
                                     SIG(u') SIG(v') SIG(w') u'v'
                                                                     v'w'
Су
                               W
        ×
               U
                       V
                                    3.344
 14.00
        9.99 13.351
                      1.997
                              .496
                                             2.974
                                                    3.017
                                                             4.734
                                                                     .667
                                                                           -.238
                                    2.862
                     1.459
                              .631
        9.99 18.506
                                             2.300
                                                    2.521
                                                            3.031
                                                                     .242
                                                                           -.209
 13.00
                     1.098
                              . 627
                                    2.122
                                            1.611
                                                    1.737
                                                            1.212
                                                                     .056
                                                                           -.150
 12.01
       9.99 21.561
                                           1.275
                     1.135
                              .630
                                    1.613
                                                    1.292
                                                            .434
                                                                    -.018
        9.99 23.305
 11.00
                                                            -.094
        9.99
             23.670
                               .450
                                     1.377
                                            1.117
                                                    1.148
                                                                    -.013
                                                                           -.137
 10.00
                     1.390
                                                            -.594
                                                                    -.060
                                                                           -.100
        9.99 23.126
                              .309
                                    1.524
                                           1.147
                                                    1.244
 9.01
                                            1.320
                                    2.064
                                                                    .006
                                                                           -.087
  8.01 10.00 21.569 1.459
                               .142
                                                    1.491
                                                           -1.318
                              .030
                     1.122
                                     1.939
                                             1.375
                                                    1.545
                                                            -1.051
                                                                    -.017
                                                                            -.069
  7.01
       10.00
             19.811
  6.01 10.00 21.503 -1.064
                                    2.792 1.931
                                                    1.850
                                                            1.461
                                                                     .087
                                                                            .026
                              -044
C FILENAME= H910A025.A 1
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
C 10 : No. of data points
                                     SIG(u') SIG(v') SIG(w') u'v'
                                                                     v'w'
                                                                            w'u'
Су
                               W
              U
                       17
        х
 15.99 25.00 10.061
                      1.296
                              .656
                                    3.007
                                             2.942
                                                    3.108
                                                             3.792
                                                                     .006
                                                                          -.409
                                    3.334
 15.01 25.00 13.384
                     1.372
                              .981
                                             3.141
                                                    3.537
                                                            5.037
                                                                     .580
                                                                           -.146
                                            2.692
                                    3.105
                                                    2.698
                                                            4.159
                                                                     .219
                                                                            .262
 13.98 25.00 18.096 1.997
                              .641
 13.01 25.00 20.982
                     1.823
1.681
                                            2.331
                                                                            -.041
                                                    2.227
                                                                     .147
                              .613
                                     2.544
                                                             2.919
                                                                            .000
                               .578
                                    1.836
                                           1.884
                                                                     .011
                                                    1.647
                                                            1.133
 12.01 25.00 23.131
                                            1.610 1.227
                                                            .053
                                                                    -.063
                                                                             .009
                     1.596
                              .419
                                    1.598
 11.01 25.00 23.785
 10.01 25.00
                      1.597
                               .322
                                     1.745
                                            1.474
                                                    1.220
                                                             -.762
                                                                    -.055
                                                                            .045
             23.147
                                            1.175
                                                    1.178
                                                            -.451
                                                                    -.011
                                                                            -.036
       25.00
             22.443
                      1.329
                               .224
                                     1.599
  9.00
                      .785
                                            1.059
                                                                            .024
  8.00 25.00 22.650
                              .139
                                    1.463
                                                    1.177
                                                             .139
                                                                    -.008
                                    3.414
                                                             2.573
                                                                     .099
                                                                             .357
                     -.695
                               .386
                                             2.664 2.441
  7.00 25.00 25.162
C FILENAME= H910A050.A 1
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm
  LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
C 11 : No. of data points
                                                            u'v'
                                                                     v^{\dagger}w^{\dagger}
                                                                            W 13 1
                       V
                               W
                                     SIG(u') SIG(v') SIG(w')
        x
               U
С
  V
                              .539
                      1.180
                                   2.244
                                             3.034 3.125
                                                            1.584
                                                                    .023
                                                                           -.563
 22.00 50.01
              5.461
                     1.858
                                    2.989
 20.00 50.01 8.297
                              .335
                                             3.616
                                                    2.814
                                                            3.995
                                                                     .348
                                                                           -.460
 18.00 50.01 12.497
15.99 50.01 17.027
                     2.452 2.399
                               .507
                                     3.382
                                             3.706
                                                    3.057
                                                             5.864
                                                                     .208
                                                                            .072
                                    3.335
                                                             5 - 571
                                                                    -.026
                                                                            -.372
                               .633
                                             3.424
                                                    2.813
 15.01 50.01 18.896 2.125
                                    3.048
                                             3.300
                                                    2.732
                                                             5.046
                                                                    -.146
                                                                           -.267
                               .630
                                            2.946
                               .450
                                    2.711
                                                    2.254
                                                            3.460
                                                                    -.107
                                                                            -.112
 14.00 50.01 20.752 2.017
                      1.571
                               .513
                                     2.367
                                             2.631
                                                    1.888
                                                             2.228
                                                                    -.364
                                                                            ~.065
 13.01 50.01
             21.779
 12.00 50.01 22.417 1.212
                               .401
                                    2.064
                                             2.305
                                                    1.541
                                                            1.151
                                                                     .037
                                                                            .032
```

```
11.01 50.01 22.970
                        .760
                                 .326
                                       1.865
                                               1.915 1.342
                                                                 866
                                                                        -.045
                                                                                 .132
 10.01 50.01 23.242
9.00 50.01 24.023
                        .159
                                 .304
                                       1.951
                                               1.681
                                                      1.250
                                                                1.024
                                                                         .027
                                                                                 .058
                        -.606
                                 .410
                                       3.002
                                               2.029
                                                       1.901
                                                                1.555
                                                                        -.012
                                                                                 .097
C FILENAME= H910A075.A 1
C H2 FLAME; d=9.45, d=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C 17 : No. of data points
         х
                U
                                 W
                                       SIG(u') SIG(v') SIG(w')
                                                                u'v'
                                                                        v'w'
                                                                                 w'u'
 26.00 75.00
               7.384
                                .058
                        3.027
                                       2.979
                                              4.200
                                                       2.627
                                                                4.247
                                                                        -.242
                                                                                 .362
                                 .198
 24.00
        75.00
                9.111
                       2.948
                                       3.197
                                               4.127
                                                       2.707
                                                                        .304
                                                                5.259
                                                                                 .254
 22.00 75.00 11.363
                       2.779
                                 .386
                                       3.360
                                               3.944
                                                       2,868
                                                                5.680
                                                                                 .135
                                                                        -.296
 21.00 75.00 12.849
                       2.941
                                .332
                                       3.487
                                               3.813
                                                       2.844
                                                                5.684
                                                                        -.183
                                                                                 .335
 20.00 75.00 13.516
                       2.452
                                 .484
                                       3.429
                                               3.787
                                                      2.814
                                                                5.763
                                                                       - 295
                                                                                -.454
 18.00 75.00 16.597
                       2.490
                                 .438
                                                      2.629
                                       3.268
                                               3.578
                                                                4.870
                                                                      -.221
                                                                                .120
 16.00 75.00 18.848
                       1.920
                                 .536
                                       3.007
                                               3.138
                                                       2.435
                                                                3.793
                                                                       -.134
                                                                                 .004
                                                                      -.060
                                               2.763 2.240
 13.99 75.00 20.661
                       1.213
                                .540
                                       2.817
                                                                3.214
                                                                                 .057
 12.00 75.00 22.061
                       .323
                                              2.370 2.068
                                 .337
                                       3.043
                                                                2.914
                                                                        .005
                                                                                 . 323
                                               2.758
2.770
 11.01 75.00 22.855
                        .240
                                 .378
                                       4.295
                                                                        .265
                                                                3.863
                                                                                .507
 10.01 75.00 24.483
                       -.380
                                 .464
                                       4.788
                                                                4.953
                                                                         516
                                                                                 .679
  8.99 75.00 28.676
                       -.669
                                .852
                                      7.402
                                                                      1.988
                                               4.117
                                                       4.754
                                                               13.723
                                                                                2.477
  7.99
        75.00 36.455
                        .335
                                .977 10.813
                                               6.120
                                                      7.304
                                                               35.643
                                                                       3.393
                                                                               2.568
                                               8.748 10.353
9.395 11.258
  5.99
        75.00 53.416
                       1.034
                               2.221 13.499
                                                               61.412
                                                                       7.484 -1.058
                               2.470 14.266
  5.01 75.00 60.641
                        .793
                                                               68.798
                                                                        5.766 -5.666
  3.99 75.00 68.597
                        .163
                               2.831 15.261
                                               9.964 11.271
                                                               76.509
                                                                       6.879 -5.052
  3.01 75.00 77.011
                               3.348 15.518 10.168 11.598
                        -.237
                                                               71.354
                                                                       7.696 -8.987
C FILENAME= H910A150.A 1
  H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm
C
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
  D090894
  14 : No. of data points
                                       SIG(u') SIG(v') SIG(w')
         ×
                TT
                                 W
                                                                11 1 17 1
                                                                        V'W'
                                                                                 w'u'
 26.00 150.00 13.188
                       1.355
                                .369
                                       2.617
                                              2.541
                                                      2.326
                                                                2.842
                                                                        -.183
                                                                                 .135
 24.00 150.00 14.244
22.00 150.00 15.443
                       1.266
                                .395
                                       2.682
                                               2.518
                                                       2.314
                                                                2.945
                                                                       -.057
                                                                                 .013
                       1.136
                                .465
                                       2.760
                                               2,369
                                                       2,285
                                                                3.002
                                                                       -.062
                                                                                .026
 20.00 150.00 16.266
                        .880
                                .567
                                       2.890
                                               2.313
                                                       2.296
                                                                3.046
                                                                       -.093
                                                                                 .269
 18.00 150.00 17.265
                        .644
                                .405
                                       3.169
                                               2.240
                                                      2.438
                                                               2.923
                                                                        .001
                                                                                 .243
                                                      2.760
 16.00 150.00 18.813
                                .476
                        .442
                                       3.699
                                               2,258
                                                               3.345
                                                                        .321
                                                                                -204
 13.99 150.00 20.606
                        .077
                                .637
                                       4.895
                                               2.598
                                                       3.516
                                                                4.734
                                                                                 .469
                                                                         .460
 12.00 150.00 26.384
                        .453
                                .972
                                       8.880
                                               4.303
                                                      5.138
                                                               19.307
                                                                       1.576
                                                                                3.483
 10.01 150.00
              34.935
                       1.042
                               1.413 10.815
                                               6.055
                                                      7.369
                                                               29.543
                                                                       4.504
                                                                               1,267
  8.00 150.00 43.767
                              1.281
                       1.632
                                      11.461
                                               6.989
                                                       8.054
                                                               36.205
                                                                       4.424
                                                                                .511
  6.00 150.00 50.078
                        .761
                               1.876 11.481
                                               7.318
                                                       8.397
                                                               34.272
                                                                       3.677
                                                                              -1.099
  3.99 150.00 56.517
                        .456
                              1.920 11.402
                                               7.713
                                                       8.120
                                                               30.486
                                                                       4.130 -4.255
  2.00 150.00 62.010
                        .561
                               2.126
                                      10.567
                                               7.794
                                                       7.664
                                                               15.784
                                                                       3.144 -7.148
   .00 150.00 64.458
                       -.241
                               2,260
                                      9.980
                                               7.621
                                                       7.656
                                                               -.326
                                                                       -.021 -10.113
C FILENAME= H910A225.A 1
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm
  LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
C 14 : No. of data points
                T)
                        v
                                 W
                                       SIG(u') SIG(v') SIG(w')
                                                                        v'w'
                                                               u'v'
                                                                                w'u'
26.00 224.99 13.859
                        .643
                                              1.929
                               .306
                                       2.756
                                                               2.235
                                                      2.454
                                                                       -.114
                                                                                .010
23.99 224.99 14.085
                        .294
                                .631
                                       2.672
                                              1.825
                                                      2.571
                                                               2.086
                                                                       -.058
                                                                               - 296
21.99 224.99 14.875
                       .108
                                             1.796
                               .557
                                       2:759
                                                      2.410
                                                               2.123
                                                                        .289
                                                                               -.041
20.00 224.99 16.546
                        .039
                               .493
                                       3.350
                                             1.929
                                                      2.741
                                                               2.240
                                                                                .439
                                                                        .384
18.00 224.99 18.138
                        .010
                               .573
                                       4.532
                                               2.252
                                                      3.095
                                                               3.777
                                                                        .516
                                                                                .648
15.99 224.99 20.981
                               .775
                        .220
                                       7.050
                                               3.288
                                                      3.985
                                                              12.176
                                                                        .830
                                                                               1.064
13.99 224.99 27.766
                      1.428
                               .617
                                      8.757
                                               4.748
                                                      5.439
                                                              19.554
                                                                        .793 -1.811
11.99 224.99 33.291
                      2.023
                               .801
                                      8.879
                                               5.418
                                                      6.434
                                                              19.446
                                                                       3.000
                                                                                .286
 9.99 224.99 36.387
                       1.545
                              1.057
                                      9.131
                                               5.596
                                                      6.431
                                                              20.540
                                                                       2.606 -1.417
 7.99 224.99 40.532
                      1.437
                              1.057
                                      9.160
                                               5.728
                                                      6.362
                                                              18.467
                                                                       3.471 -1.287
 5.99 224.99 43.072
                      1.100
                              1.001
                                      8.722
                                               5.727
                                                      6.376
                                                              13.724
                                                                       3.019 -2.843
 3.98 224.99 46.149
                       .752
                               1.044
                                      8.423
                                               5.810
                                                      6.213
                                                               9.809
                                                                        .323 -2.927
 2.00 224.99 47.194
                        .255
                              1.354
                                      8.497
                                              5.876
                                                      5.942
                                                               7.068
                                                                       1.973 -4.286
```

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-.618 1.528 -4.175
   .00 224.99 48.258 -.130 1.318 8.323 5.928 5.928
C FILENAME= H910A001.E 1
C H2 FLAME; d=9.45, d=1.2 \text{ mm}; theta=0 deg.; Uj=100, Ua=20, Ue=4 \text{ m/s}; x=1.5 \text{ mm}
 LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C
C D090894
 8 : No. of data points
С
                                      SIG(u') SIG(v') SIG(w')
                                                              11 ' V '
                                                                      v'w'
                      v
                               W
        х
               TT
                                                              .011
                                                                     .002
                                                                             .007
                                     .267
                               .182
        1.50
              4.138
                      -.225
                                              .200
                                                     .363
 26.00
                     -.273
-.328
       1.50
             4.164
4.168
                               .183
                                      .280
                                               .217
                                                      .386
                                                              .009
                                                                      .006
                                                                              .011
 24.00
                                                                      .003
                                                                             .019
                                                      .384
                                                              .000
                               .206
                                      .275
                                               .203
 22.00
        1.50
                                                     .377
                                                                      .001
                               .215
                                      .310
                                                             -.008
                                                                             .017
        1.50
              4.109
                     -.420
                                              .207
 20.00
                                                      .377
                               .176
                                      .354
                                                             -.015
                                                                      .003
                                                                             .008
                     -.527
                                               .228
        1.50
              3.916
 18.00
                                                      .404
                               .135
                                              .333
                                                             -.028
                                                                      .007
                                                                             -.002
 16.00
        1.50
               3.522
                      -.631
                                      .518
                                              707
                                                      564
                                                             -.023
                                                                      .009
                                                                            -.005
                      -.667
                               .110
                                       .755
 15.00
        1.50
               3.316
                                                                      .195
                                                                            -.110
                                                             2.684
                     -.761
                               .166
                                     2.376
                                             2.349 2.058
14.00
       1.50
              5.913
C FILENAME= H910A010.E 1
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
 9 : No. of data points
C
                      v
                               ΤAT
                                     SIG(u') SIG(v') SIG(w')
                                                              u'v'
                                                                      v'w'
        x
               TT.
                                                                      .001
                                                                             .009
                                      .268
                                                              .012
       9.99
              4.057
                      -.191
                               .185
                                              .202
                                                     .365
 26.00
                                                                      .003
             4.080
                               .186
                                                      .376
                                                              .007
                                                                             .014
 24.00 10.01
                                      .276
                                              .200
                     -.223
                                                                      .003
                                              .211
                                                     .361
                                                              .006
                                                                              .014
 22.00 10.00 4.070 -.245
                               .204
                                      .284
             3.974
                                      .306
                                              .240
                                                      .402
                                                             -.002
                                                                      .001
                                                                              .019
 20.00 10.01
                      -.279
                               .180
                                                     .408
                                      .427
                     -.327
                               .183
                                              .354
                                                             -.007
                                                                      .006
                                                                             015
 18.00 10.01
               3.884
                               .072
                                                     .809
                                                              .079
                                                                      .054
                                                                            -.070
              3.881
                     -.400
                                       .932
                                            1.022
 15.99 10.01
                               .182
                                                             2.713
                                                                      .220
                                                                            -.066
 15.00 10.01
              6.767
                      -.058
                                      2.452
                                             2.218
                                                     2.032
 14.00 10.01 12.051
                                             2.926
                                                             5.324
                                                                      .514
                                                                            -.284
                       .058
                               .194
                                     3.435
                                                     2.981
                                                                            -.759
 13.02 9.99 17.365
                     -.423 -.059
                                     3.287 2.739
                                                     2.927
                                                             4.405
                                                                      .381
C FILENAME= H910A025.E 1
C
C H2 FLAME; d=9.45, d=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
 8 : No. of data points
С
                                                                      v'w'
                               W
                                     SIG(u') SIG(v') SIG(w')
                                                              u'v'
               7.7
                      V
Су
        x
                                                                     .001
                               .175
                                                              .011
                                                                             .008
 26.00 25.00
              4.005
                      -.140
                                      .269
                                              .208 .351
                               .183
                                      .293
                                                                      .004
             4.018
                                              .235
                                                      .368
                                                              .008
                                                                             .012
 24.00 25.00
                     -.152
                                      .365
                                                     .414
                     -.189
                               .174
                                               .321
                                                              .003
                                                                     -.001
                                                                              .019
 22.00 25.00
              4.037
                                              .474
                                                     .452
                                                                              .008
 20.00 25.00
              4.030
                     -.210
                               .156
                                      .497
                                                              .004
                                                                     -.004
                                                              .128
                                                                     .008
                                                                            -.016
              4.516
                     -.243
                               .126
                                       .920
                                             1.050
                                                      .822
 18.00 25.00
                                                                      .278
                               .265
                                     2.989
                                                                            -.367
                      .158
                                             2.417
                                                     2.409
                                                             3.424
 16.00 25.00
              9.378
                      -.014
                               .334
                                      3.326
                                             2.804
                                                     2.883
                                                              4.763
                                                                      .478
                                                                            -.388
 13.99 25.00
             16.563
                                             2.487
                                     2.898
                                                     2.332
                                                             3.512
                                                                     -.114
                                                                            -.702
 12.00 25.00 21.931
                     -.588
                               .358
C FILENAME= H910A050.E 1
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
C
  8 : No. of data points
                                                              u'v'
                                                                     v'w'
                                                                             w'u'
Су
                    v
                                     SIG(u') SIG(v') SIG(w')
            U
                               W
        ×
                                            .521 .362
                               .173
                                                              .009
                                                                     -.002
                                                                              .008
 26.00 50.01
              4.014
                      -.166
                                      .495
             4.184
                                                     .432
                                      .658
                                                              .040
                                                                     -.021
                                                                             .020
                     -.148
                               .159
                                              .790
 24.00 50.01
                               .166
                                                                     -.037
                                                                            -.016
 22.00 50.01 4.563
                     -.210
                                       .954
                                            1.222
                                                      .699
                                                              .076
                     -.136
                                                             1.450
              6.542
                               .148
                                     2.102
                                             2.057
                                                     1.634
                                                                     -.019
                                                                            -.340
 20.00 50.01
                                                                     .455
                                                             4.435
                                                                            -.328
       50.01
             10.668
                       .035
                               .281
                                     3.294
                                             2.810
                                                     2.528
 18.00
                                                                      .281
                               .317
                                                             6.076
                                                                            -.349
 16.00 50.01 15.573
                      -.041
                                     3.466
                                             3.162
                                                     2.867
                                                                      .280
                               .491
                                     3.336
                                            3.112 2.617
2.760 2.199
                                                             5.591
                                                                            -.767
 13.99 50.01 19.151
                     -.557
                                                     2.617
                               .403
                                                                            -.651
                                     2.998
                                                             3.911
                                                                     -.257
 12.00 50.01 21.461 -1.138
C FILENAME= H910A075.E 1
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
```

```
C D090894
  9 : No. of data points
                       V
         x
                IJ
                                W
                                       SIG(u') SIG(v') SIG(w') u'v'
                                                                               w'u'
                                              1.620
 26.00 75.00
                5.194
                        -.098
                                .177
                                                       .854
                                                                .418
                                       1.307
                                                                       -.125
                                                                               -.024
 24.00 75.00
                6.701
                        .086
                                .109
                                       2.150
                                               2.184
                                                       1.564
                                                                1.742
                                                                        .040
                                                                               -.187
 22.00 75.00 9.055
                        .162
                                .174
                                       2.921
                                               2.705
                                                       2.121
                                                                        -.008
                                                                3.838
                                                                               -.340
 20.00 75.00 11.928
18.00 75.00 14.922
                        .059
                                .352
                                       3.285
                                               3.161
                                                       2.446
                                                                                .197
                                                                5.536
                                                                        .162
                        .024
                                .365
                                       3.493
                                               3.164
                                                       2.591
                                                                6.028
                                                                        .136
                                                                               -.068
 15.99 75.00 17.368
                       -.057
                                .387
                                       3.402
                                               3.163
                                                       2.472
                                                                5.601
                                                                        -.276
                                                                               -.378
 13.98 75.00 19.431
                       -.658
                                .434
                                       3.300
                                               2.825
                                                       2.380
                                                                4.550
                                                                       -.150
                                                                               -.544
 11.99 75.00 20.703
                      -1.043
                                .356
                                       3.466
                                               2 511
                                                       2.162
                                                                3.736
                                                                       -.197
                                                                               -.459
 10.01 75.00 22.745 -1.801
                                .450
                                      4.035
                                               2.347
                                                       2.662
                                                                3.753
                                                                        .345
                                                                               -.174
C FILENAME= H910A150.E 1
C
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
  D090894
   9 : No. of data points
         x
                IJ
                                 W
                                       SIG(u') SIG(v') SIG(w')
                                                               u'v'
                                                                        v'w'
                                                                                w'u'
 26.00 150.00 12.845
                        .923
                                .453
                                       2.789 2.340 2.095
                                                               3.212
                                                                       -.155
                                                                               -.329
                        .707
 24.00 150.00 13.699
                                       2.903
                                              2.329
                                . 621
                                                      2.040
                                                               3.363
                                                                        .033
 21.99 150.00 15.031
                        .708
                                .553
                                       2.821
                                               2.236
                                                      2.069
                                                               3.232
                                                                       -.171
                                                                               -.310
 20.00 150.00 15.774
                        .482
                                .600
                                       3.021
                                               2.265
                                                       2.155
                                                               3.214
                                                                        .197
 18.00 150.00 16.715
                        .120
                                .620
                                       3.110
                                              2.048
                                                      2.223
                                                               2.857
                                                                        .198
                                                                               -.198
 15.99 150.00 17.843
                       -.150
                                .759
                                              2.035
                                       3.353
                                                      2.436
                                                               2,610
                                                                        .332
                                                                               -.249
 13.99 150.00 19.280
                      -.640
                                .814
                                       4.053
                                               2.192
                                                       2.859
                                                               2.895
                                                                        .575
                                                                               -.214
 11.99 150.00 22.967 -1.142
                                .958
                                      6.779
                                               3.018
                                                       4.267
                                                               5.932
                                                                       2,001
                                                                               1.061
 10.00 150.00 30.751 -1.102
                                .971 11.799
                                                              22.973 2.529 -1.235
                                               4.961
                                                       6.557
C FILENAME= H910A225.E 1
C H2 FLAME; d=9.45, d=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm
  LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
   8 : No. of data points
                IJ
                       V
        x
                                 W
                                       SIG(u') SIG(v') SIG(w')
                                                               u'v'
                                                                        v'w'
                                                                               w'u'
 24.00 224.99 14.751
                        .363
                                .701
                                       2.699 1.762 2.105
                                                               1.993
                                                                        .193
                                                                               -.227
 22.00 224.99 15.446
20.00 224.99 16.355
                        .136
                                .761
                                       2.893
                                              1.815
                                                      2.252
                                                               1.917
                                                                        .312
                                                                               -.362
                      -.121
                                .734
                                       3.255
                                              1.892
                                                      2.519
                                                               1.932
                                                                        .647
                                                                               -.298
 18.00 224.99 17.343
                      -.407
                                .970
                                       3.747
                                              2.097
                                                      2.755
                                                               2.065
                                                                        .926
                                                                               .058
 16.00 224.99 19.461
                       -.663
                                .836
                                       5.412
                                              2.478
                                                      3.426
                                                               3.677
                                                                       1.383
                                                                               - 691
 13.98 224.99 26.148
                       -.188
                                .883
                                       9.087
                                              4.516
                                                      5.373
                                                              17.095
                                                                       2.148 -1.517
 11.99 224.99 28.479
                                .971 10.307
                       -.364
                                              4.875
                                                       5.436
                                                              21.305
                                                                       1.763 -5.351
 10.00 224.99 34.217
                       -.232
                                .944 10.652
                                              5.866
                                                      6.676
                                                              26.045
                                                                       4.184 -5.463
C FILENAME= H910AAX.J 1
 H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; y=0 mm
  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
 15 : No. of data points
                                      SIG(u') SIG(v') SIG(w')
                         V
                                W
                                                               u'v'
  У
                                                                       v'w'
                                                                               W 111 1
   .00
       1.50 131.512
                        .000
                                .001
                                      5.862
                                              4.915
                                                      4.512
                                                               1.286
                                                                       -.468
                                                                               -.745
   .00
        9.99 130.673
                       -.100
                               -.020
                                       6.099
                                              5.139
                                                      4.679
                                                               1.325
                                                                       1.608
                                                                              -.457
   .00
       20.00 131.064
                       -.149
                               .163
                                      7.035
                                              5.487
                                                     4.950
                                                               1.540
                                                                        .985 -2.055
   .00 30.00 128.996
                       .004
                                .108
                                      7.831
                                              6.396
                                                      5.788
                                                                .227
                                                                       1.258 -2.861
                                                     7.263
   .00 40.01 126.374
                       -.013
                               .296
                                      9.131
                                              7.820
                                                               1.248
                                                                        .055 -3.821
                       .022
   .00 50.01 120.103
                               .188 11.510
                                             9.643
                                                     8.915
                                                              1.325
                                                                      1.872 -7.895
   .00
       60.01 112.032
                        .224
                                .436 13.760 10.941
                                                                      4.954 -15.811
                                                     9.740
                                                              -2.350
   .00 70.00 102.820
                                .478 14.161 11.604 10.167
                        .122
                                                              -5.010
                                                                      1.854 -16.516
   .00 80.00 95.617
                        .220
                               .237 13.727 10.920
                                                     9.830
                                                              -3.495
                                                                       2.634 -14.290
                                .681 12.971 10.467
.518 12.178 9.957
   .00 90.00 88.453
                        .559
                                                     9.936
                                                              -6.182
                                                                     3.347 -15.853
   .00 100.00 83.341
                        .354
                                              9.957
                                                                       .314 -12.619
                                                      9.457
                                                              ~.633
                                                     8.797
  .00 110.00 78.419
                        .072
                               .579 11.143
                                              9.197
                                                                .886
                                                                       -.264 -10.265
   .00 120.00 74.499
                        .093
                                .421 10.948
                                              8.689
                                                     8.487
                                                              -1.518
                                                                       .552 -10.724
   .00 130.00 70.498
                        .244
                                .309 10.133
                                                     8.023
                                              8.112
                                                               .996
                                                                       .378 -7.248
  .00 140.01 67.579
                        .429
                                .155
                                      9.426
                                              7.546
                                                      7.736
                                                               -.470
                                                                       .004 -5.501
  .00 150.00 64.617
                               .146
                        .257
                                     9.153
                                              7.232
                                                      7 426
                                                                       .052 -4.828
                                                               .571
   .00 160.01 62.182
                        .075
                                .155
                                     8.870
                                              6.803
                                                      6.977
                                                                .614
                                                                       .573 -5.556
   .00 170.00 59.249
                        .134
                                .254
                                      8.125
                                              6.563
                                                     6.738
                                                               1.174
                                                                        .022 -6.182
```

```
.207 -.033 7.806 6.187
.093 -.254 7.857 6.103
                                              6.187 6.568
6.103 6.401
                        .207
                                                                . 963
                                                                        .401 -4.973
   .00 180.00 57.779
                                                                        .982 -2.481
                                                               -.007
   .00 190.01 55.479
                                                                        -.203 -4.028
                                      7.415
                                               5.544
   .00 200.00 53.964
                        .206
                               -.082
                                                       6.109
                                                                .836
                                                                        .456 -4.756
                                                                1.010
                                               5.224
                                                       5.713
                        .017 -.232
                                      6.703
   .00 225.01 48.959
C FILENAME= H910A001.J 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm
  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894
C 12 : No. of data points
                                                                         w'^2v' w'^2u'
                          v'^3
                                                                 v'^2w'
                u'^3
                                             u'^2v'
                                                       v'^2u'
                                    w'^3
Су
         ×
                                  50.087 245.489 833.072 -29.863 29.152 49.309 -19.634
        1.50 1562.036 -382.566
  4.70
                                                                -38.068 30.652
                                                                                    3.701 -63.160
                                  71.065 265.304 333.434
       1.50 2437.059 381.794
                                  50.865 -112.384 -470.196
       1.50 -642.317
                                                                 52.704
                                                                           .412 -15.351
                                                                                            63.083
                        -92.079
  4.30
                                    4.738 -306.442 -476.785
                                                                  3.467
                                                                           13.224 25.254
                                                                                            -6.228
        1.50 -945.043 -233.448
  4.00
                                                                                           38.152
                                                                         3.741 -36.892
       1.50 -410.518 -135.516
                                  -11.838 -207.688 -199.746
                                                                  7.477
  3.51
                                  -25.396 -150.274 -120.081
                                                                 15.252
                                                                           9.293 -25.985
       1.50 -286.334 -66.701
  3.01
       1.50 -229.818
                                                                           2.108 -25.897 15.329
                                   -2.106 -126.313 -123.771
                                                                  4.527
                         -85.377
  2.51
                        -69.088
                                    6.301 -116.971 -106.533
                                                                 12.430 -5.525 -29.304 -14.275
        1.50 -231.383
  2.00
                                                                   3.778 -6.788 -17.136 11.108
       1.50 -168.110 -39.530
                                  10.965 -82.035 -91.560
  1.51
                        -29.633
                                                                          -1.445 -21.908
                                     7.722
.450
                                            -57.436 -68.811
-30.021 -52.971
       1.50 -140.013
                                                                   3.093
                                                                                             9.129
  1.01
                                                                   3.442 -2.930 -15.439
                                                                                            2.688
        1.50
               -89.287
                         -2.172
  .51
                        -1.078
                                     5.151 4.033 -55.670
                                                                 3.096 2.482 -12.272 -1.265
              -78.508
   .00
       1.50
C FILENAME= H910A010.J 2
C H2 FLAME; d=9.45, d=1.2 \text{ mm}; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 \text{ mm}
C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
  D090894
C 10 : No. of data points
                u'^3 v'^3
                                                                 v'^2w' w'^2v' w'^2u'
                                    w'^3
                                             u'^2v'
                                                       v'^2u'
                                                                                            11 1 ^ 2 w 1
Су
        x
                                                                -35.092 107.965 138.361 -48.609
                                  134.321 927.474
  5.50 10.00 1628.901
                         622.678
                                                       782.019
  5.00 10.00 1884.693 543.053 138.645 717.447 636.102
                                                                 5.459 151.495 156.292 50.796
                                  27.694
                                                                -48.765 58.425 69.308 -63.859
                                             35.173 105.835
  4.51 10.00 736.676 216.092
  4.01 10.00 -1052.929 -308.546
                                    32.980 -613.052 -484.723
                                                                 57.862
                                                                            .444 -161.183 88.925
                                                                  -4.426 -50.519 -63.276
  3.41 10.00 -1153.586 -370.605
                                  -18.407 -576.754 -453.430
                                   -1.988 -179.257 -150.112
                                                                  24.199 -27.839 -34.101
                                                                                            28 288
       9.99 -369.418 -158.914
  2.70
                                   3.913 -114.534 -83.993
9.018 -69.181 -70.791
                                                                         -2.926 -25.920
  2.01 10.00 -245.885
                        -60.805
                                                                  4.720
                                                                                            15.248
                        -47.499
                                                                  6.718 -8.043 -20.201
                                                                                            4.518
  1.30 10.00 -155.232
  .62 10.00 -137.494
                        -19.169
                                  -11.707 -40.983 -59.452
                                                                  -.666 2.284 -16.251 12.703
                        -6.741 13.853 1.461 -61.079
                                                                  5.134 -2.807
                                                                                   -8.854
   .01 10.00 -92.551
C FILENAME= H910A025.J 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm
  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C
C D090894
C 12 : No. of data points C y x u'^3
                          v'^3
                                    w'^3
                                             u'^2v'
                                                       v'^2u'
                                                                 v'^2w' w'^2v'
                                                                                  w'^2u'
C y x 7.00 25.00
                                                               26.013 117.589 229.569 -17.412
              829.139
                        268.345
                                  68.860 413.198 363.521
 6.01 25.00 1386.980 427.715 77.129 615.419 560.900 -5.456 118.938 181.441 9.312 5.51 25.00 1507.366 523.400 8.018 754.207 664.117 21.976 83.152 181.815 -23.634 5.01 25.00 1607.587 479.055 -142.991 667.429 622.570 -45.080 146.553 124.339 -151.453
 4.50 25.00 1211.457 246.965 26.761 323.925 336.570 27.604 51.902 -7.717 37.545
4.01 25.00 -263.515 5.718 -128.188 -226.056 -163.980 -25.763 -77.398 -221.657 5.243
3.41 25.00 -1180.836 -242.840 -135.294 -644.693 -580.470 36.908 -17.224 -142.556 -20.790
                                                                 19.852 28.977 -137.165 17.710
  2.70 25.00 -1812.605 -525.707
                                  23.277 -856.518 -700.881
                                  -14.955 -303.576 -304.230
2.449 -131.384 -134.855
                                                                 41.419 -32.670 -77.626
  2.01 25.00 -721.307 -258.486
                                                                                            34.024
                                                                -13.735 -19.483 -23.200
                                                                                            -8.653
  1.29
       25.00 -244.235 -117.180
                                            -44.750 -80.036
                                                                 4.023 -5.282 -15.735
                                                                                           1.806
   .62 25.00 -120.980
                        -44.730
                                    14.749
                                              4.003 -56.919
                                                                   1.700
                                                                          -.154 -17.931
   .01 25.00 -81.419
                        -2.124
                                     6.030
C FILENAME= H910A050.J_2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm
  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
  D090894
C
C 11 : No. of data points
                                    w'^3
                                                       v'^2u'
                                                                 v'^2w' w'^2v' w'^2u'
       x u'^3 v'^3
                                             u'^2v'
                                                                                           11 1 ^ 2 W 1
Су
                       136.088 37.100 194.729 179.374
                                                                 2.402
                                                                           44.291 134.218 -20.876
  8.80 49.99
               466.255
```

```
8.22 49.99 456.533 169.355 58.912 241.002 222.303 22.540 56.344 135.537
                                                                                                 8.450
               833.647 249.858
1235.980 405.349
  7.01 49.99
                                     8.604 375.224 327.119 -24.243 127.320 182.563 -27.584
                           405.349 -101.261 562.325 519.095
496.288 -84.271 632.151 616.590
  6.00 49.99 1235.980
                                                                    8.078 110.716 210.989 -53.178
  5.01 49.99 1659.615 496.288 -84.271
                                                                    43.380 116.778
                                                                                      48.729 -113.415
  4.00 49.99
                778.382 209.363 -237.581 222.756 194.256 -14.063 85.042 -95.282 -96.964
  2.72 49.99 -1202.364 -278.238
                                     5.084 -552.570 -481.321 -34.290 -12.726 -263.861
  2.00 49.99 -1707.252 -418.185
                                   -10.981 -757.963 -729.538
                                                                    41.395 -47.972 -393.221
                                                                                                 42.242
  1.30 49.99 -1960.485 -255.059
                                   30.201 -683.661 -775.475
                                                                    66.513 -40.300 -294.940
                                                                                                82.635
   .60 49.99 ~1223.460 -151.798
                                    36.132 -258.810 -618.087 61.448 -10.199 -146.456 55.876
   .00 49.99 -1087.148
                          28.435
                                    9.674 110.823 -580.952 11.205 -22.326 -218.811
C FILENAME= H910A075.J 2
C H2 FLAME; d=9.45, d=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm
C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894
C 12 : No. of data points
                 u'^3
                            v1^3
                                     w'^3
         ×
                                               u'^2v'
                                                        v'^2u'
                                                                    v'^2w'
                                                                             w'^2v'
                                                                                      w'^2u'
                                                                                                u'^2w'
 11.00 75.00
               357.516
444
                                    -3.386 127.082 117.636 -5.829 47.466 129.293
                           81.373
                119.672
444.495
                                                                                               -9.410
  9.49 75.00
               357.516 119.672 17.079 169.400 171.885 12.979 47.279 115.396 -34.371 444.495 199.563 -14.902 239.037 242.680 -.035 92.002 136.433 -2.801 849.833 278.370 10.607 377.976 345.766 21.623 68.222 62.182 -34.363
  8.23 75.00
  7.01 75.00
  5.99 75.00 1068.688 364.761 -89.555 441.560 453.568
                                                                    4.984 120.430 86.940 -107.747
  5.00 75.00 857.188 337.500 21.326 320.210 378.324 -27.151 91.160 -8.857 -126.833 3.99 75.00 656.792 236.892 -240.132 162.667 194.019 -17.016 110.329 35.735 -103.193
  3.99 75.00 656.792 236.892 -240.132 162.667 194.019 -17.016 110.329 35.735 -103.193 2.72 75.00 -96.111 118.330 -169.995 -140.028 -96.066 -5.739 12.898 -185.387 48.807
  2.72 75.00 -96.111 118.330 -169.995 -140.028 -96.066 -5.739 12.898 -185.387 48.807 2.00 75.00 -417.963 -150.258 -127.887 -300.325 -421.355 13.946 16.266 -178.949 -55.781
   .61 75.00 -738.124 -17 == 0
  1.30 75.00 -793.852
                                    -29.836 -275.895 -498.250 -75.794 -2.111 -186.231 50.128
                                   -46.159 -142.388 -488.847
                                                                    33.365 -16.025 -117.758 108.125
                         -6.256 -5.594 102.609 -532.337 43.564
   .00 75.00 -736.543
                                                                             5.272 -185.678
                                                                                               66.883
C FILENAME= H910A150.J 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C 15 : No. of data points
                                               u'^2v'
                                                        v'^2u'
                u'^3
                          v!^3
        x
                                      w'^3
                                                                  v'^2w' w'^2v'
                                                                                      w'^2u'
                                                                                                u'^2w'
 16.00 150.00 176.555
                           40.168
                                                                   1.841 19.679
.689 38.283
                                     16.919
                                                47.265
                                                          72.829
                                                                                      68.415
                                                                                                -4.401
                                                45.558 70.859
 13.99 150.00 147.179
                         55.646 -15.253
                                                                                       71.176
                                                                                                9.025
11.99 150.00 156.735
10.00 150.00 128.487
                         57.844
                                                88.451 86.198 10.507 54.390
                                   75.617
                                                                                       61.585
                                                                                                -7 867
                128.487
                           69.212
                                                84.020 100.775 -10.504 32.138 23.611 -8.276
91.190 96.403 -6.614 42.950 31.114 -10.953
                                    -14.046
  9.00 150.00 185.200
                                   -13.905
                           78.924
                                                91.190 96.403 -6.614 42.950
65.224 82.230 -4.469 40.777
                                                                                      31.114 -10.953
-4.670 -31.476
  8.01 150.00 160.377
                         75.197
                                     1.314
                                   -16.080 70.561 96.569 -10.024 19.465 -25.967 -14.230
15.107 9.241 44.767 -3.088 12.081 -35.209 9.289
-30.844 -38.578 21.582 -2.356 -.076 -71.407 -3.732
  7.01 150.00
               166.506
                           80.946
  5.99 150.00
                 72.178
                           45.256
  5.00 150.00 -11.005 24.761
  3.99 150.00
                37.112
                           5.632
                                     -.834 -23.388 19.143 -7.976 -12.553 -40.368 15.244
  3.00 150.00 -29.489
                           13.553
                                     12.117
                                                                    -8.348 -16.073 -54.427
                                              -46.315
                                                          -6.719
                                                                                                2.712
                                     13.298 -43.363 -10.249 -15.657
  2.01 150.00
               -25.123 -12.986
                                                                             -3.760 -67.558
                                                                                                19.394
  1.01 150.00
                           1.690
               -23.057
                                    -17.297
                                              -34.052 -45.706
                                                                    8.879
                                                                               8.063 -65.288
                                                                                                -6.989
               -31.389
                                     4.108 -18.373 -54.384
9.560 -12.355 -35.326
   .51 150.00
                           -2.781
                                                                    -5.547 -12.615 -58.013
                                                                                                18.273
   .00 150.00 -170.792 -17.533
                                                                    9.382
                                                                             -8.847 -69.756
                                                                                                8.618
C FILENAME= H910A225.J 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm
  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
 D090894
C 13 : No. of data points
        ×
                u'^3
                           v1^3
                                     w'^3
                                              u'^2v'
                                                         v'^2u' v'^2w'
                                                                            w'^2v'
                                                                                       w'^2u' u'^2w'
24.00 225.00
                                                                            -1.691
                 68.766
                           15.188
                                                                  -1.001
                                     19.442
                                               19.195
                                                          27.957
                                                                                       25.546 -3.330
21.99 224.99
                84.776
                           18.335
                                     -5.061
                                                27.797
                                                          35.605
                                                                     5.759
                                                                              7.527
                                                                                       29.779
                                                                                                -4.377
20.00 224.99
                80.578
                           23.507
                                     -9.003 22.509
                                                       40.002
                                                                            11.449
                                                                                       29.565 -17.184
                                                                     5.552
               129.026
18.00 224.99
                           25.468
                                     3.306 38.535 42.537
                                                                   -1.481
                                                                             9.702
                                                                                       23.145
                                                                                               6,427
15.99 224.99
                                                                            11.350
                99.259
                           29.280
                                    -11.734
                                               22.955
                                                         34.178
                                                                   -1.376
                                                                                       27.096
                                                                                                -4.537
                                    -.011 20.756
13.99 224.99
                 28.924
                          25.387
                                                          33.624
                                                                   -2.393
                                                                            13.665 10.780 -4.073
14.451 12.731 15.161
11.99 224.99 110.227
                           41.725 -35.198 46.378
                                                          54.909
                                                                   -6.874
10.00 224.99
                                     .033 -1.737
                -1.512
                           15.017
                                                        15.423
                                                                    1.935
                                                                             5.208 -10.260
                                                                                               -2.752
                                                       6.015
                           15.361
 8.00 224.99
                -3.664
                                   -12.087
                                               -3.881
                                                                    -4.940
                                                                              2.586 -14.696
                                                                                                -4.459
 5.99 224.99 -21.806 15.942 -4.566 -16.928
                                                           .859
                                                                      .872
                                                                              2.871 -18.660
                                                                                                 6.156
```

```
12.905 -10.967 2.028 -2.616 -6.873 -24.804
                                                                                       5.811
  3.98 224.99
             -44.285
                        -2.668
             -30.515
                        -2.023
                                -7.264
                                           -.283
                                                    -3.836
                                                             2.410 -4.164 -17.802 15.406
 2.00.224.99
                                                                       2.750 -18.681
                                             .283
                                                    -7.339
                                                              -2.724
                                                                                       6.797
                         6.772
                                  9.005
   .01 224.99
               -1.164
C FILENAME= H910A001.A 2
C H2 FLAME; d=9.45, d=1.2 \text{ mm}; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
C 11 : No. of data points
                        v'^3
                                   w'^3
               u'^3
                                           u'^2v'
                                                    v'^2u'
                                                             v'^2w'
                                                                      w'^2v'
                                                                             w'^2u'
                                                                                      u'^2w'
        x
                                                    -8.605
                                                             1.131
                                                                     -1.446 -1.339
                                   1.477
                                           -9.625
       1.50
              -10.120
                        -9.827
 13.50
                                                              .077
                                                                                       - 970
                                          -5.433
                                                    -4.586
                                                                     -1.623 -1.002
 13.00
       1.50
               -9.595
                        -4.839
                                   -.856
                                   .013
                                           -1.854
                                                    -1.404
                                                               -.146
                                                                      -.735
                                                                               -.462
                                                                                       -.535
                        -1.178
 12.49
       1.50
               -4.456
                                   .390
                                                                               -.367
                                                                                       -.137
                                           -1.283
                                                     -.952
                                                              -.091
                                                                       -.334
 12.00
        1.50
               -2.474
                         -.730
       1.50
                                                               .011
               -1.390
                                   .233
                                            -.871
                                                     -.559
                                                                       -.079
                                                                               -.125
                                                                                       -.153
                         -.333
 11.19
                                                               .019
                                                                      -.046
                                                                                .028
                                                                                       -.006
                         -.219
                                   .096
                                           -.450
                                                     -.265
 10.40
       1.50
               -.496
                                           .012
                                                                                .044
                          .065
                                                               -.058
                -,230
                                   -.054
                                                     -.245
                                                                       .011
                                                                                       -.079
 9.60
       1.50
                                                               .019
                                                                               - 192
                                                                                       - 146
                -.873
                          .424
                                   .032
                                             .578
                                                     -.452
                                                                        . 232
 8.20
        1.50
                                                               .091
                                                                       .320 -.681
                                                                                        .025
       1.49
               -4.175
                         1.129
                                   -.052
                                            2.044
                                                    -1.213
 6.99
                                            .947
                                   .255
                                                    -.147
                                                               .175
                                                                       .043
                                                                                .296
                                                                                        -.197
               -4.833
                         -.215
  6.01
       1.50
       1.50
               3.104
                         -.017
                                    .267
                                            -.951
                                                      .192
                                                               -.017
                                                                       -.040
                                                                                . 304
                                                                                        .103
 5.51
C FILENAME= H910A010.A 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
C
  9 : No. of data points
               u'^3
                                                                      w'^2v'
                                                                             w'^2u'
                        v1^3
                                                                                      u'^2w'
                                  w1^3
                                          u'^2v'
                                                    v'^2u'
                                                             v'^2w'
C
        х
                                                             -.440
                                                                             1.114
                                                                                      -1.042
                1.389
                        -7.563
                                -1.638
                                                    -3.528
                                                                     -1.588
      9.99
                                           -2.738
 14.00
                                                                                      -1.101
       9.99
               -8.091
                        -6.965
                                  -1.018
                                           -6.090
                                                    -5.153
                                                               .201
                                                                      -3.376
                                                                              -2.023
13.00
                                          -1.853
                                                                              -.587
                                                                                       -.268
               -2.832
                        -2.010
                                  .005
                                                    -1.475
                                                              -.126
                                                                      -1.223
 12.01
        9.99
                                                                                        .037
                                                              -.059
                                                                       -.254
                                                                               -.155
               -.810
                         -.473
                                   .118
                                            -.630
                                                     -.571
 11.00
       9.99
                                                              -.051
                                                                        .019
                                                                               -.015
                                                                                       - 078
                          .168
                                  -.002
                                           -.018
                                                     - 394
 10.00
       9.99
               -.125
               -1.419
                          .602
                                   .056
                                             .794
                                                     -.601
                                                               .039
                                                                        .280
                                                                               -.339
                                                                                       -.081
 9.01
        9.99
 8.01 10.00
                          .856
                                   -.051
                                            1.747
                                                    -1.115
                                                               -.077
                                                                       .500
                                                                               -.758
                                                                                       -.279
               -3.595
                                                                        .192
                                                     .098
                                   .392
                                                               .090
                                                                                .008
                                           -.470
                                                                                       -.021
 7.01 10.00
               1.177
                          .720
                         1.054
                                    .921
                                            2.706
                                                     -.116
                                                                .356
                                                                       1.002
                                                                               -.361
                                                                                        .125
 6.01 10.00
                1.591
C FILENAME= H910A025.A 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
C 10 : No. of data points
Су
                                          u'^2v'
                                                                             w'^2u'
               u'^3
                        v'^3
                                  w'^3
                                                   v'^2u'
                                                            v'^2w'
                                                                     w'^2v'
                                                                                      u'^2w'
       x
                                          4.294
                                                   4.118
                                                              .096
                                                                      1.539
                                                                              -.118
                                                                                        .904
 15.99 25.00
                5.763
                         4.470
                                  15.198
                        -1.315
                                  31.928
                                             .691
                                                      .379
                                                               -.080
                                                                     -1.623
                                                                               -.586
                                                                                      -2.309
 15.01 25.00
                2.487
                                  .864
                                           -6.833
                                                    -5.385
                                                              -.763
                                                                     -3.474 -2.165
                                                                                       -.759
 13.98 25.00
               -9.824
                        -6.627
                                                                             -2.581
                                   .076
                                           -7.019
                                                    -5.834
                                                              -.482
                                                                     -3.190
                                                                                       -.353
13.01 25.00
               -9.883
                        -6.685
                                   .490
                                           -1.960
                                                    -1.983
                                                                      -1.132
                                                                               -.712
                                                                                       -.124
 12.01 25.00
               -2.223
                        -1.530
                                                               .411
                                            .173
                                                    -1.306
                                                                       -.305
                                                                               -.253
                                                                                       -.136
                                                               -.063
 11.01 25.00
               -1.289
                         -.198
                                   .092
                                   .039
 10.01 25.00
              -1.489
                          .676
                                             .782
                                                     -.870
                                                               .018
                                                                       .124
                                                                              -.161
                                                                                       -.122
                          .202
                                                     .015
                                                                                .005
                                                                                        .068
                .164
                                            -.200
                                                               -.010
                                                                        .071
                                  -.042
 9.00 25.00
                                                               .007
                                                                               -.147
                                                                                        -.130
                -.680
                          .130
                                   -.054
                                            -.103
                                                     -.120
                                                                        .107
  8.00
       25.00
                                                                               3.068
                                   5.151
                                            9.741
                                                     8.655
                                                               .528
                                                                        .244
                                                                                       1.397
 7.00 25.00
               18.837
                         4.564
C FILENAME= H910A050.A 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
С
 D090894
C 11 : No. of data points
                         v1^3
                                  w'^3
                                           u'^2v'
                                                    v'^2u'
                                                              v'^2w'
                                                                     w'^2v'
                                                                              w'^2u'
                                                                                      u'^2w'
              u'^3
        x
  v
                                                                               .421
                                  35.236
                                            5.314
                                                     4.822
                                                               .012
                                                                      2.974
                                                                                       -.163
 22.00 50.01
                5.214
                        16.415
                                                                       4.356
                                                                               1.350
                                                                                        . 883
                                            8.093
                                                     9.962
 20.00 50.01
               11.089
                         18.201
                                  6.274
                                                               . 834
                                                                       .548
                                             .810
                                   4.978
                                                     2.015
                                                               -.953
                                                                              1.812
                                                                                      -1.094
 18.00 50.01
                .775
                        8.450
                                                               .792
                                                                                        .985
                        -5.901
                                   3.604
                                          -11.235
                                                    -9.904
                                                                      -6.485
                                                                              -3.684
 15.99 50.01
             -16.610
                                                                .907
                        -7.847
                                   5.811
                                          -12.135
                                                   -12.109
                                                                     -5.975
                                                                              -4.652
                                                                                        -.481
 15.01 50.01
              -15.110
                                   .860
                                                               .534 -5.544 -4.321
                                          -11.668
                                                   -11.942
                                                                                        .495
 14.00 50.01
             -16.038
                        -8.647
```

```
.943
 13.01 50.01 -9.561
                             -5.671
                                                   -7.829
                                                              -7.921
                                                                          1.047
                                                                                  -3.185
                                                                                            -2,424
                                                                                                        .138
 12.00 50.01
                  -4.737
                             -4.902
                                          .518
                                                   -3.980
                                                                          -.039 -1.958
                             -2.105
                                                              -5.251
                                                                                             -1.273
                                                                                                         .169
                                          .365
 11.01 50.01
                  -3.691
                                                   -2.395
                                                              -2.354
                                                                           -.169
                                                                                    -.919
                                                                                              -.377
                                                                                                         -.334
 10.01 50.01
                  -5.175
                             -1.806
                                           .159
                                                    -1.655
                                                               -2.106
                                                                           -.051
                                                                                    -.489
                                                                                              -.536
                                                                                                        -.208
                              .413
   9.00 50.01
                  -6.929
                                          2,297
                                                   1.273
                                                               -.870
                                                                           .014
                                                                                     .094
                                                                                             -1.063
                                                                                                         . 898
C FILENAME= H910A075.A 2
C H2 FLAME; d=9.45, d=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm
   LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
C 17 : No. of data points
                                        w'^3
Су
                   11.1^3
                              W1 ^ 3
          ×
                                                   u'^2v'
                                                              v'^2u'
                                                                        v'^2w' w'^2v'
                                                                                             w'^2u'
                                                                                                       11 1 ^ 2 12 1
 26.00 75.00
                                                  12.070
                                                             7.392 3.751 5.547 2.493
4.803 1.578 3.141 2.304
                  14.451
                              19.985
                                          .042
 24.00 75.00
                  9.198
                             21.233
                                          1.646
                                                     7.749
                                                                                                        -.290
                  5.050
 22.00 75.00
                                                               1.913
                           15.911
                                        2.364
                                                    6.226
                                                                          -.341
                                                                                     .643
                                                                                               .712
                                                                                                         .102
                                        1.306
                    .364
 21.00 75.00
                              6.333
                                                   1.187 -3.936
                                                                         -.885
                  1.121
                                                                                    - 723
                                                                                              1.274
                                                                                                        -.754
 20.00 75.00
                             11.579
                             11.579 3.565 1.381 -2.665
-4.766 1.042 -7.247 -11.518
                                                                          .887
                                                                                    .032
                                                                         .887 .032 .265

-.564 -5.115 -2.610

.882 -4.938 -2.338

-.052 -3.109 -1.970
                                                                                              .265
                                                                                                        -.915
 18.00 75.00 -12.087
                                                                                                        1.411
 16.00 75.00 -13.229
                             -3.612 2.522 -8.666 -10.366
                                                                                                       .793
 13.99 75.00 -11.436
12.00 75.00 -16.344
                 -11.436
                             -3.672 1.811 -6.670 -6.336
                                                                                                         .488
                                        .912 -4.481 -3.617
.292 14.590 1.655
                             -3.485
                                                                         -.432 -1.464 -1.721
 11.01 75.00
                   -.623
                             7.353
                                                                                  5.950 -1.575
                                                                          -.405
                                                                                                       -.077
                                          -.073 21.796 12.023
 10.01 75.00
                  64.995
                           11.894
                                                                          1.036
                                                                                    7.913
                                                                                             8.418
                                                                                                        -.392

    8.99
    75.00
    365.086
    57.559
    34.343
    124.875
    89.449
    11.661
    28.527
    65.343
    4.770

    7.99
    75.00
    824.162
    213.161
    29.915
    335.669
    262.621
    26.813
    119.019
    183.825
    15.997

    5.99
    75.00
    947.620
    304.129
    -64.660
    365.143
    314.226
    21.521
    184.222
    156.662
    24.459

    5.01
    75.00
    875.199
    317.222
    -119.410
    315.672
    223.678
    4.335
    145.247
    -18.400
    -35.543

  3.99 75.00
               806.435 332.287 -94.775 262.985 255.678 -36.053 85.109 -22.027 -9.691 544.053 310.744 -240.650 112.648 83.569 59.941 91.491 -161.282 -33.843
  3.01 75.00
                                                            83.569
                                                                         59.941 91.491 -161.282 -33.843
C FILENAME= H910A150.A 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm
  LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
                                      w'^3 u'^2v' v'^2u' v'^2w' w'^2v' w'^2u' u'^2w' .936 1.434 .795 -.135 427
C 14 : No. of data points
                           v'^3
         x u'^3
                            4.230
2.572
2.440
                                                 1.434
                                                           .795
 26.00 150.00
                   1.081
                                                                       -.135
                  .291
 24.00 150.00
                                                   .769
.119
                                                                                    .958
                                          .854
                                                               -.047
                                                                          .197
                                                                                              -.182
                                                                                                        -.140
                                          .725
 22.00 150.00
                   .671
                                                               .597
                                                                          -.338
                                                                                     .293
                                                                                                        .230
                                                                                              -.264
                             2.769
2.538
 20.00 150.00
                   3.837
                                      1.807
                                          .583 1.531 1.948
1.807 3.576 2.259
-.430 8.757 5.398
                                                                      -.387 1.183 1.062
                                                                                                        -.386
                12.235
 18.00 150.00
                                        1.807 3.576
-.430 8.757
                                                                                  3.077
                                                                         .254
                                                                                              3.390
                                                                                                        -.106
 16.00 150.00
                             4.926
                29.935
                                                               5.398
                                                                           .196
                                                                                    3.851
                                                                                              8.196
                                                                                                        -.619
 13.99 150.00 136.151 10.020 5.877 26.343 20.878 12.00 150.00 641.860 75.019 20.726 186.612 133.900 10.01 150.00 463.331 117.523 -16.708 186.317 170.730 8.00 150.00 112.704 115.886 -26.546 78.417 112.892
                                                                      2.925
                                                                                    9.147
                                                                                             35.038
                                                                                                        1.149
                                                                      12.230 41.069 130.059 14.519
                                                                       6.736
8.740
                                                                                 82.872 145.401 -39.628
70.762 87.079 -22.541
                                                                                           87.079 -22.541
                             67.399
55.858
  6.00 150.00
                                      -69.327 -6.619
-47.857 -70.630
                 -98.463
                                                            46.711
                                                                       32.500 35.301 -16.051
                                                                                                       8.832
  3.99 150.00 -232.690
                             34.266 -58.709 -97.961 -135.850 -890
                                                                                   -.886 -65.234 12.723
  2.00 150.00 -274.785
                                                                                  -5.114 -94.865
                                                                                                      47.819
   .00 150.00 -312.290
                             34.718 -24.355
                                                 5.838 -131.566
                                                                         10.724 -10.352 -58.159 87.618
C FILENAME= H910A225.A 2
C H2 FLAME; d=9.45, d=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
C 14 : No. of data points
Су
                 u'^3
                             v'^3
         х
                                        w'^3
                                                  u'^2v'
                                                                                            w'^2u' u'^2w'
2.861 -1.892
                                                             v'^2u'
                                                                        v'^2w'
                                                                                  w'^2v'
 26.00 224.99
                  10.404
                             2.712
                                       1.544
                                                           2.251
2.773
                                                  2.542
                                                                        -.249
                                                                                  1.878
                            2.153
                                      4.267
 23.99 224.99
                  11.900
                                                  3.260
                                                                       -.376
                                                                                 2.104
                                                                                             1.904
                                                                                                       -.962
                                                  2.573
 21.99 224.99
                                                             1.847
                  10.578
                              1.820
                                         3.059
                                                                         -.078
                                                                                  1.366
                                                                                              2.042 -.481
 20.00 224.99
                                        3.229
                  32.165
                             2.004
                                                    6.552
                                                               5.232
                                                                         -.185
                                                                                   2.839
                                                                                              7.571
                                                                                                       -.011
 18.00 224.99 125.142
                             6.206
                                    4.020 22.748 15.613
                                                                         -.332
                                                                                   9.955
                                                                                            26.862
                                                                                                       3.579
15.99 224.99 443.888
13.99 224.99 308.127
                             39.644 8.411 113.133 69.927
72.701 8.657 95.962 94.187
                                                                        3.981 23.470
                                                                                            70.004 16.748
                                        8.657 95.962 94.187
5.066 11.894 49.567
                                                                        -1.532
                                                                                  37.167 86.052
                                                                                                     -8.029
 11.99 224.99
                48.722 58.825
                                                             49.567
                                                                        5.108
                                                                                   30.872
                                                                                            43.050
                                                                                                     -7.941
                32.189
 9.99 224.99
                             42.570 -15.959
                                                                                 24.624
                                                                                           19.109 -25.938
                                                 11.495
                                                           38.183
                                                                       -1.880
 7.99 224.99 -105.125
                                       -6.793 -37.053 11.684
14.128 -27.152 -12.824
                             26.743
                                                                                 23.747 -8.546 15.040
                                                                       9.622
 5.99 224.99 -24.205
                             12,309
                                                                        1.056
                                                                                  3.591 -27.057 29.185
```

```
-1.126 -18.155
8.407 -5.832

    -24.606
    -34.397
    -4.028
    11.649
    -21.843

    -39.740
    -42.751
    3.486
    -1.081
    -41.546

                                                                                        22.491
  3.98 224.99 -119.602
                                                                                       18.667
  2.00 224.99 -179.148
   .00 224.99 -145.987
                         -6.803
                                 -17.867
                                           -7.455 -46.711
                                                               1.674 -10.709 -36.749
                                                                                       29 430
C FILENAME= H910A001.E 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
  8 : No. of data points
C
                        v1^3
               u'^3
                                   w1^3
                                           u!^2v!
                                                     v!^2u!
                                                             v'^2w'
                                                                      w'^2v'
                                                                               w'^2u'
                                                                                        1114211
Су
        x
                 .005
                                           .001
                                   .003
                                                     .001
                          .002
                                                                .002
                                                                        .001
                                                                                 .002
                                                                                         .001
 26.00
        1.50
                                             .001
                                                       .000
                           .002
                                    .002
                                                                .002
                                                                         .001
                                                                                 .000
       1.50
 24.00
                 .003
                                             .000
                                                                                          .001
                 .003
                                   .003
                                                      .001
                                                                .001
                                                                        .000 -.001
 22.00
       1.50
                          .000
                          .000
                                   .005
                                             .003
                 .000
       1.50
                                                     -.001
                                                                .001
                                                                         .002
                                                                                 .000
                                                                                          .003
 20.00
                                    .005
                -.017
                          .001
                                             .007
                                                     -.003
                                                                .002
                                                                         .002
                                                                                -.002
                                                                                          .003
 18.00
        1.50
       1.50
                                             .008
                                                                        .001
                                    .009
                -.054
                          -.001
                                                     -.006
                                                               -.001
                                                                                 .002
                                                                                          0.01
 16.00
                                              .036
                                                     -.057
                                                               .007
                                                                         .018
                                                                                -.036
                                                                                          .003
                -.100
                          .048
                                   -.017
 15.00
       1.50
                                                     8.692
                                                                .705
                                                                        1.502
                                                                                2.628
               14.580
                          9.204
                                   .525
                                            9.330
                                                                                          .193
 14 00
       1.50
C FILENAME= H910A010.E 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
C 9 : No. of data points
C y x u'^3
                         v1^3
                                   w1^3
                                           u'^2v'
                                                   v'^2u'
                                                             v'^2w'
                                                                     w'^2v'
                                                                              w'^2u'
                .005
                          .002
                                                              .000
                                                                                       .001
      9.99
                                   .000
                                            .001
                                                     .001
 26.00
                                                                      .000 .001
                          .001
                 .005
                                    .003
                                                       .001
                                                                                 .004
                                             .001
                                                                .001
                                                                         .001
                                                                                          .001
 24.00 10.01
                 .004
                                    .005
                                                                                 .002
                                                                                          .002
 22.00 10.00
                          .001
                                             .001
                                                       .000
                                                                -002
                                                                         .002
                                                                                         .002
 20.00 10.01
                          .002
                                                                        .000
                                                                                -.001
                 .002
                                    .005
                                             .001
                                                      -.001
                                                                .001
                                    .006
                                             .004
                          .005
                                                     -.005
                                                                .001
                                                                        .001
                                                                                -.003
                                                                                         -.002
                -.014
 18.00 10.01
                                    .051
                                             .143
                                                      .166
                                                                .088
                                                                         .145
                                                                                -.017
                                                                                          .056
 15.99
      10.01
                -.040
                          .177
 15.00 10.01
                                    .352
                                                     7.588
                                                                                3.558
                                                                                          .505
                                            8.069
                                                                .594
                                                                        2.744
               13.741
                         8.513
                                                                                3.797
                                            4.974
                                                     5.625
                                                               1.418
                                                                        2.577
                                                                                         1.658
               7.910
                         6.912
                                   -.830
 14.00 10.01
 13.02 9.99
                                                      -.848
                                                                .376
                                                                        -.661
                                                                               -1.900
                                                                                         1.238
               -3.732
                        -1.014
                                 -2.164
                                            -1.853
C FILENAME= H910A025.E 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
 8 : No. of data points
С
               u'^3
                        v1^3
                                                                               w'^2u'
                                   w1^3
                                           u'^2v'
                                                     v'^2u'
                                                              v'^2w'
                                                                      w'^2v'
С
        x
                          .001
                                   .005
                                                                                       .001
                .005
                                           .001
                                                    .001
                                                              .001
                                                                       .001
                                                                              .001
 26.00 25.00
 24.00 25.00
22.00 25.00
                 .004
                                    .001
                                             .000
                                                                .000
                                                                                 .000
                          .002
                                                      .000
                                                                        -.001
                                                                                          .000
                                    .002
                                             .003
                                                                .000
                                                                        .002
                          .006
                                                     -.001
                                                                                -.001
                                                                                         .001
                 .001
                          .017
                                             .004
                                                                                -.001
                -.026
                                    .005
                                                     -.012
                                                                .002
                                                                        .007
                                                                                         -000
 20.00 25.00
                 .206
                           .372
                                   -.147
                                             .196
                                                      .192
                                                               -.010
                                                                         .126
                                                                                 .036
                                                                                         -.042
 18.00 25.00
                          7.959
                                            7.940
                                                                                3.462
 16.00 25.00
               16.468
                                   -.137
                                                     6.863
                                                                . 693
                                                                        2.031
                                                                                         .291
                                            -.832
                                                     -.776
                                                                               -1.264
 13.99 25.00
               -1.714
                          -.375
                                   -.754
                                                               -.419
                                                                        .661
                                                                                         -.467
                                                                      -2.173 -3.010
 12.00 25.00
              -10.744
                        -3.179
                                   -.400
                                           -5.182
                                                     -3.815
                                                               -.421
                                                                                         .514
C FILENAME= H910A050.E 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
C 8 : No. of data points
                         v'^3
                                   w'^3
                                           u'^2v'
                                                                     w'^2v'
               u'^3
                                                     v'^2u'
                                                              v'^2w'
                                                                              w'^2u'
Су
        ×
                          .035
                                   .004
 26.00 50.01
                -.038
                                            .006
                                                    -.019
                                                             -.003
                                                                      .003 -.001
                          .172
                                                             -.016
                                                                        .022
                                                                              -.019
                                             .034
                                                                                         - 006
 24.00 50.01
                -.055
                                   -.010
                                                     -.032
                                                      .207
                                    .003
                                             .122
                                                                .001
                                                                                 .004
                                                                                        -.015
 22.00 50.01
                 .072
                           .599
                                                                         .185
                                                      4.751
                                                               -.303
                                                                       1.840
                                                                                2.168
                                                                                         -.700
 20.00 50.01
                8.746
                          5.805
                                   -.526
                                             4.071
              17.568
                       16.351
                                   -.048
                                           10.518
                                                    11.843
                                                               .554
                                                                      3.860
                                                                                4.303
                                                                                        -.198
 18.00 50.01
                        12.139
                                           3.544
               4.037
                                  -1.447
                                                      7.002
                                                               -.628
                                                                      -1.246
                                                                                 .779
                                                                                        -.129
 16.00 50.01
                                  .187
               -8.605
                         2.515
                                           -5.100
                                                     -1.718
                                                               -.929
                                                                      -2.811
                                                                               -3.228
                                                                                        -.273
 13.99
       50.01
                                    .264
 12.00 50.01
             -12.562
                        -1.492
                                           -5.902
                                                     -3.816
                                                               -.499 -1.700 -1.680
                                                                                         .547
C FILENAME= H910A075.E 2
```

```
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
  D090894
   9 : No. of data points
Су
                u'^3
                          v1^3
                                  w'^3
         x
                                           1114271
                                                     v'^2u'
                                                              v'^2w' w'^2v'
                                                                               w'^2u'
                                                                                       u'^2w'
 26.00 75.00
                 .766
                          1.588 .006 .486
                                                     .869
                                                              -.001 .346
                                                                              .133
                                                                                       -.018
 24.00 75.00
                 8.891
                          9.001
                                   -.606
                                            4.665
                                                     6.125
                                                               -.343 2.576
                                                                              2.570
                                                                                        -.646
 22.00 75.00
              15.231
                        17.363
                                  -1.395
                                                                              4.453
                                           10.832
                                                     12.361
                                                              -.073
                                                                       4.178
                                                                                        -.547
 20.00 75.00
              12.969
                         22.315
                                   .346
                                            9.432
                                                     13.428
                                                               .089
                                                                       2.714
                                                                               4.363
                                                                                        -.201
 18.00 75.00
15.99 75.00
                4.128
                       13.266
                                    .366
                                            2.681
                                                     5.284
                                                              -1.236
                                                                        .571
                                                                               1.727
                                                                                       -1.210
                                                     -.391
               -6.099
                          7.288
                                   -.541
                                           -4.063
                                                              -1.360 -2.816
                                                                               -1.535
                                                                                        .119
                                                                     -1.356
 13.98 75.00
                          2.488
               -9.314
                                                                               .189
                                   .334
                                           -3.569
                                                     -.948
                                                              -1.103
                                                                                        - 637
 11.99 75.00
10.01 75.00
              -12.138
                          .520
                                   -.797
                                            -1.478
                                                      -.639
                                                              -.687
                                                                       .134
                                                                                 .118
                                                                                        -.740
                4.981
                          1.422
                                                      3.138
                                   .175 3.207
                                                               .708
                                                                       2.003
                                                                                3.620
                                                                                        2.266
C FILENAME= H910A150.E 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
  9 : No. of data points
c y
              u'^3
                         v'^3
        x
                                   w'^3
                                           u'^2v'
                                                    v'^2u'
                                                             v'^2w'
                                                                     w'^2v' w'^2u'
                                                                                      u'^2w'
 26.00 150.00
                         4.253
                                                                              1.650
                -.458
                                  -.726
                                           1.107
                                                     1.776
                                                                                       .253
                                                              -.442
                                                                       .822
 24.00 150.00
                                            .832
               -1.108
                       3.596
                                   .172
                                                      2.012
                                                               -.551
                                                                        .396
                                                                               1.431
                                                                                         .485
 21.99 150.00
                        2.622
3.091
               2.204
                                 -1.614
                                             .854
                                                     1.769
                                                               -.098
                                                                              1.604
                                                                       1.019
                                                                                        .087
 20.00 150.00
                 .129
                                                                       .777
                                  -1.586
                                             .640
                                                     1.490
                                                                              1.228
                                                               -.049
                                                                                         .127
 18.00 150.00
               7.790
                        2.480
                                   .281
                                            2.444
                                                      2.951
                                                               -.473
                                                                       1.252
                                                                               2.047
                                                                                       -1.329
 15.99 150.00
               14.632
                        2.150
                                    .908
                                            2.542
                                                      3.647
                                                               .672
                                                                       1.893
                                                                               4.241
                                                                                       -.667
 13.99 150.00
               54.371
                         3.342
                                   4.012
                                           6.618
                                                    7.155
                                                               1.226
                                                                      2.839
                                                                              7.973
                                                                                      -1.497
 11.99 150.00
              433.947
                        10.692
                                  12.204
                                           58.756
                                                                     19.211
                                                     45.915
                                                               3.403
                                                                              80.675
                                                                                      -3.562
                        98.716 -28.174 370.951 242.491
 10.00 150.00 1520.931
                                                                      87.363 313.234 -94.495
                                                               .252
C FILENAME= H910A225.E 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm
  LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
  8 : No. of data points
                       v'^3
              u'^3
8.529
                                 w'^3
        x
                                           11 1 ^ 2 77 1
                                                    v'^2u'
                                                              v'^2w'
                                                                      w'^2v'
                                                                              w'^2u'
                                                                                       u'^2w'
 24.00 224.99
                         1.837
                                  -.212
                                           2.502
                                                              .350
                                                     1.966
                                                                       1.775
                                                                             2.828
                                                                                       .326
                                 -.238
 22.00 224.99
              13.352
                        2.091
                                            2.181
                                                     2.831
                                                               .383
                                                                       1.891
                                                                               3.417
                                                                                       -1.306
                        2.573
 20.00 224.99
               19,218
                                   .740
                                           1.051
                                                    3.681
                                                               .949
                                                                     2.874
                                                                               6.201
                                                                                      -.751
 18.00 224.99
               47,113
                         2.082
                                   -.925
                                            3.636
                                                     8.712
                                                             1.129
                                                                     1.895
                                                                             10.460
                                                                                      -1.952
 16.00 224.99
                                 -9.319
             226.099
                         7.689
                                                              1.021 6.478 37.702 -9.970
2.835 37.748 131.841 -16.770
                                           28.078
                                                    26.281
 13.98 224.99
              610.585
                                -13.838 171.353
                        58.387
                                                  128.819
11.99 224.99 886.338 92.028 -23.204 249.748 180.213
10.00 224.99 395.767 113.335 -27.368 155.002 150.415
                                                             -3.171 37.467 145.100 -72.778
                                                              .681 47.844 134.532 -62.446
C FILENEME= H910AAX.J 2
C
C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; y=0 mm
  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
  D090894
C 22 : No. of data points
              u'^3
                        v'^3
Су
        ×
                                  w'^3
                                                   v'^2u'
                                                                     w'^2v'
                                           u'^2v'
                                                             v'^2w'
                                                                             w'^2u'
                                                                                      u'^2w'
                                                  -55.685
  .00
       1.50
              -87.970
                        -5.887
                                  -3.569
                                           -7.544
                                                             -1.071
                                                                     -3.549 -12.483
                                                                       .065 -4.527
                                                                                      .112
  .00 9.99
             -89.744
                        1.101
                                  5.366
                                           -2.582
                                                   -61.014
                                                              4.336
                                                                                       -.591
  .00 20.00
             -91.203
                                                  -69.367
                        -5.843
                                 13.955
                                          -2.911
                                                              3.147
                                                                       2.806 -15.479
                                                                                       8.344
  .00 30.00 -160.425
                        -9.364
                                  2.053
                                          14.437 -120.660
                                                                     -4.632 -20.315 15.304
                                                             8.024
  .00 40.01 -450.552
                       -24.895
                                  23.117
                                          -17.819 -268.002
                                                              2.159
                                                                     -5.184 -35.735
                                                                                     31.361
  .00 50.01 -1029.567
                                82.893
                                         10.017 -591.720
                       -48.922
                                                             29.863
                                                                     22.887 -123.032
                                                                                      47 646
  .00 60.01 -1502.238
                      75.065
                                50.352
                                        23.718 -737.912
                                                           90.181 ~11.550 -236.167 243.795
       70.00 -1081.373
                       66.723 -46.689
  .00
                                         51.971 -650.900 38.663 -11.523 -137.459 136.247
  .00 80.00 -721.883
                                                            9.926 -24.513 -136.079 135.917
                       -64.057
                                 5.633
                                         85.661 -377.494
  .00 90.00 -354.860
                       24.212 -28.932
                                           4.310 -283.321
                                                              6.094 -14.421 -142.766 126.007
  .00 100.00 -156.685
                       -29.255 38.505 -37.933 -183.546
                                                             9.104
                                                                     -9.518 -149.521
                                                                                       6.850
  .00 110.00 -80.893
                        10.745
                                 -41.396 -11.854 -171.965
-1.134 -24.621 -97.892
                                -41.396
                                                             6.568 -40.658 -100.645
                                                                                      45.520
                        8.896
  .00 120.00 -113.858
                                                                                     16.397
                                                              7.825
                                                                    -25.003 -82.638
  .00 130.00 -68.767
                       15.706 -9.503 -17.950
                                                  -91,901
                                                             29.162 -32.711 -84.635
                                                                                      16.813
  .00 140.01
              -26.552
                       -7.046
                                 27.341
                                                                     9.714 -81.442
                                         -27.531
                                                   -49.845
                                                             -3.789
                                        -21.696
                                                                                      32,559
  .00 150.00 -54.684
                         .654
                                 -6.674
                                                   -40.904
                                                             -9.455
                                                                     -6.697 -68.489
                                                                                       8.071
```

```
10.201
-1.157
                                                  -8.571 -18.388
2.255 -5.947
                -35.158
-46.869
                             -8.660
                                                                          5.243 2.629 -32.249
    .00 170.00
   .00 180.00
                 -11.563
                               6.847
                                         5.065
                                                   -16.861 -28.017
                                                                          -9.884
                                                                                    -4.793 -43.937
                               7.424
                                        -14.184
                                                    13.673
                                                              -20.364
                                                                          1.566
                                                                                     4.696 -44.147
    .00 190.01
                 -33.267
                                                                                     4.344 ~37.920
    .00 200.00
                 -12.499
                               -.346
                                        4.332
                                                     3.657
                                                              -9.893
                                                                          -8.210
    .00 225.01
                -25,958
                              -5.128
                                         25.229
                                                    -1.711
                                                                .133
                                                                          -3.685 -9.656 -25.486 14.612
C FILENAME= H904A001.J 1
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm
  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894
C 12 : No. of data points
                                                                        u'v'
                                                                                 v'w'
  y x U
4.70 1.50 40.383
                  U
                                     W
                                            SIG(u') SIG(v') SIG(w')
                                 2.012 11.492 5.335 7.141 19.370
                                                                               -.559 -1.173
                           4.218
                                                                     37.920
        1.50 53.430 2.067 1.990 16.069
                                                    8.412
                                                              6.758
                                                                               -.543 -6.864
  4.51
                                                                     44.752 -1.080 -7.813
46.124 -1.664 -4.921
         1.50 72.362 2.113
1.50 91.288 1.494
                                   1.109 18.736 10.552
                                                              6.806
  4.30
                                   .537 16.024
                                                    8.913
                                                              6.972
  4.00
         1.50 103.895
                           .678
                                    .374 11.732 7.627
                                                                     39.229
                                                              7.162
                                                                                -.819 -3.870
  3.49
                                   .696 10.207 6.897
.445 9.052 6.596
.247 8.395 5.944
                         .695
        1.50 110.943
                                                             7.133 31.270
                                                                                .134 -3.573
  3.01
                           .426
                                                                     25.089
19.743
         1.50 116.721
                                                              6.500
                                                                                  .541 -4.699
  2 49
                                                                                 1.393 -1.646
  2.00
          1.50 120.962
                           .232
                                                              6.103
                           .432
                                           7.477 5.733
                                                              5.625
  1.50
         1.50 124.389
                                    .137
                                                                      14.381
                                                                                 .146 -1.937
                           .164
                                    .097
                                           6.910 5.362
6.353 4.978
   .99
         1.50 127.509
                                                              5.194
                                                                      11.236
                                                                                 -.143 -1.624
                                                                                 .717 -2.212
                           .032
                                    .012
                                                              4.863
                                                                        6.173
   .51
         1.50 129.352
                                           6.243 4.936 4.570
        1.50 130.160
                           .001 -.001
                                                                                  .418 -1.805
                                                                       1.985
   . 01
C FILENAME= H904A010.J 1
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm
C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894
C 10 : No. of data points
                                     TAT
                                           SIG(u') SIG(v') SIG(w') u'v'
                                                                                 77 1 W 1
                                                                                          W 111 t
Су
         x
                 Ü
                           T/
  5.50 10.01 51.940 11.972 5.242 15.243 12.375 16.260 119.284 -3.818 -6.450
4.99 10.01 60.036 12.064 4.903 16.862 12.665 16.359 126.302 -1.777 -8.456
  4.51 10.01 68.664 9.709 4.033 18.411 13.372 15.965 123.777 -2.310 -21.042 3.99 10.01 82.532 6.545 3.314 19.378 13.254 14.994 105.242 5.736 -22.463 3.42 10.01 96.032 1.742 2.301 17.259 12.292 12.861 76.342 -3.266 -20.280
                         -.619 1.274 14.328 10.257 10.134
  2.71 10.01 107.880
                                                                     59.417 -2.495 -8.435
                                                                     28.489 -1.107 -4.697
16.943 -.050 -2.943
                                   .758 10.804
                          -.811
                                                    8.013
                                                              7.461
  2.01
         9.99 116.029
                                                    6.520 6.111
                         -.609
                                    .380
                                                                                -.050 -2.943
  1.29
         9.99 121.748
                                           8.723
                         -.901
                                    .206
                                                                      8.962
                                                                                 .138 -2.709
   .61
                                           7.664 5.625 5.228
          9.99 125.466
                                    .325
                                           6.929 5.354 4.952
                                                                        3.798
   .00
         9.99 127.080 -1.035
                                                                                -.528 -2.026
C FILENAME= H904A025.J 1
C H2 FLAME; d=9.45, d=16.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm
C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894
C 13 : No. of data points
C y x 7.99 25.00 43.437
                                     W
                                           SIG(u') SIG(v') SIG(w') u'v'
                                                                                 v'w'
                            V
                         4.394
                                   6.989 12.674 11.048 12.435 16.416
                                                                                 .126 -2.087
  7.00 25.00 46.055 7.038 6.532 12.729 11.098 14.022 53.677 -.861 -2.186 6.01 25.00 50.729 8.306 6.178 14.435 11.632 15.556 90.290 -8.833 -14.738 5.49 25.00 54.794 8.912 5.362 15.802 11.887 16.413 104.354 1.050 -9.924
  5.00 25.00 57.864 8.586 5.203 16.523 12.662 16.803 113.009 2.419 -5.296
  4.50 25.00 62.663 8.003 4.757
4.01 25.00 67.947 7.432 4.325
                                   4.757 17.202 12.749 17.162 114.261 -.207 -9.127
4.325 18.020 13.320 16.639 113.540 -7.323 -19.253
  3.41 25.00 77.940 6.410 3.788 19.408 13.562 16.134 102.907 -2.649 -21.557
                         4.492 3.062 19.451 13.196 15.276 92.649 3.944 -24.651 2.076 2.123 18.260 12.089 13.661 77.892 3.489 -26.090
  2.70 25.00 89.439
        25.00 100.476
  2.01
                          .221 1.109 15.989 11.399 11.336 59.757 1.557 -11.454
  1.29 25.00 109.338
                         -.523 .897 12.941 10.176 9.634 42.626 2.184 -10.756
-1.172 .467 11.173 8.947 8.543 18.756 2.927 -11.596
   .60 25.00 116.105
   .00 25.00 119.865 -1.172
C FILENAME= H904A050.J 1
C
  H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm
С
C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
```

.00 160.01

8.735

-9.474 -13.093 -55.635

30.547

7.874

19.545

21.872

12.712

```
C D090894
C 11 : No. of data points
          x
                TT
                        V
                                 W
                                       SIG(u') SIG(v') SIG(w') u'v'
                                                                         v'w'
                                                                                 w 111 1
                        4.630 5.918 12.419 10.005 11.640
4.432 5.236 12.440 10.879 12.217
  8.81 49.99 40.846
                                                               12.621
                                                                         1.727 -3.374
  8.20 49.99 42.216
                       4.432
                                                                14.501
                                                                         2.674 -4.591
                       6.814
  7.01 49.99 45.940
                                                                61.247 -1.226 -2.091
                                4.914 12.943
                                               9.767 13.069
                                3.173 13.872 10.668 13.909
3.287 14.459 11.236 15.013
  5.99 49.99 49.358
                        6.320
                                                                65.856
                                                                          .392 -1.821
  5.00 49.99 54.590
                       6.836
                                                                85.015
                                                                         5.206
                                                                                4.824
  3.99 49.99 61.018
                                2.396 16.574 12.229 15.192
                       6.875
                                                                90.822
                                                                         1.749 -1.807
                               1.606 17.784 12.849 15.459
1.026 18.667 13.634 15.450
.884 19.050 13.570 14.996
  2.73 49.99
               69.151
                        5.840
                                                                87.294
                                                                        1.816 -5.681
  2.01 49.99 73.364
                        4.661
                                                                88.929
                                                                         5.917 -9.422
  1.29 49.99 80.808
                        3.731
                                                                75.479
                                                                         2.706 -16.564
   .60 49.99 83.540
                        2.351
                                 .430 18.934 14.036 14.325
                                                                53.765
                                                                        6.846 -19.777
                                 .301 19.127 13.992 14.236
   .00 49.99 86.729
                        1.424
                                                                46.533 2.496 -24.027
C FILENAME= H904A075.J 1
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm
C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894
  11 : No. of data points
   v
         x
                 U
                                  W
                                        SIG(u') SIG(v') SIG(w') u'v'
                                                                         v'w'
                                                                                 w'u'
  9.50 75.00 36.965
                              4.961 10.112
                        4.423
                                               7.464 9.049
                                                               23.819
                                                                        -.412
                                                                                 -.363
  8.20 75.00 40.955
                       4.893
                              3.955 10.371
                                               7.553 9.990
                                                                34,462
                                                                        -.774
                                                                                 .178
                      3.861
                              2.875 10.275
        75.00 42.799
                                               8.053 10.435
                                                                26.292 -2.208
                                                                                 -.875
  6.01 75.00 46.762
                              2.454 11.278
1.624 11.439
                                               8.431 10.751
8.648 11.179
                        4.759
                                                                39.688 1.883
                                                                                 3.204
  4.99 75.00 49.659
                       4.881
                                                                40.661
                                                                         -.894
  4.01 75.00 52.499
2.72 75.00 54.486
                       4.602
                              1.204 12.183
                                               9.150 11.603
                                                                44.169 -2.928
                                                                                2 732
               54.486
                        3.303
                                               9.399 11.737
9.676 11.865
                                .459 12.405
                                                                40.341 -1.227
                                                                                -.840
                                 .582 12.483
  2.01 75.00 57.766
                        3 418
                                                                34.556
                                                                        2.092 -2.221
  1.29 75.00 59.273
                       2.550
                                .241 12.692
                                               9.808 11.821
                                                                         .093
                                                                27 399
                                                                                - 316
                       2.161 .233 13.169 10.073 11.433
1.626 -.112 12.640 10.316 11.666
   .61 75.00
              61.049
                                                                23.326 -1.222 -5.202
   .00 75.00 62.194
                                                               18.046 3.303 -1.802
C FILENAME= H904A150.J 1
C H2 FLAME; d=9.45, d=10.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm
  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894
  9 : No. of data points
Су
                         V
        x
                 IJ
                                 W
                                        SIG(u') SIG(v') SIG(w') u'v'
                                                                         v'w'
                                                                                 w'u'
 13.99 150.00 29.324
                        3.167
                               3.126
                                        5.863 4.028 5.296
                                                                9.852
                                                                         .043
                                                                                 -.628
 12.00 150.00 30.726
                       3.039
                               2.525
                                        5.914
                                               4.066
                                                        5.115
                                                                9.253
                                                                         .898
                                                                                 .083
 10.01 150.00 31.997
                       2.817
                               1.723
                                        5.998
                                               4.165
                                                        5.323
                                                                8.313
                                                                         -.178
                                                                                 .703
  7.99 150.00 33.687
                       2.473
                               1.264
                                        5.847
                                               4.338
                                                      5.342
                                                                7.287
                                                                         .006
                                                                                  -979
  5.99 150.00 34.913
                       2.160
                                .800
                                        5.902
                                               4.252
                                                        5.191
                                                                5.046
                                                                          .619
                                                                                 2.336
  3.98 150.00 37.109
                                .467
                        2.124
                                        5.968
                                               4.408
                                                        5.431
                                                                 4.635
                                                                         .270
                                                                                 2.718
  2.01 150.00 37.181
                       1.363
                                .182
                                        5.939
                                               4.510
                                                        5.257
                                                                         .694
                                                                2.884
                                                                                 2,206
  1.00 150.00
              37.597
                        1.138
                               -.077
                                        6.016
                                               4.510
                                                        5.215
                                                                2.852
                                                                         .174
                                                                                 2.062
   .01 150.00 37.905
                        .799
                               -.076
                                        5.992
                                               4.543
                                                        5.389
                                                                 .912
                                                                          .527
                                                                                 1.548
C FILENAME= H904A225.J 1
C H2 FLAME; d=9.45, d=10.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm
  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
  D090894
C 10 : No. of data points
                        V
                TT
                                W
                                       SIG(u') SIG(v') SIG(w') u'v'
                                                                         v'w'
                                                                                 W 11 1
                              1.964
1.970
 18.00 224.99 25.810
                       2.400
                                       4.048
                                               2.853 3.703
                                                                3.770
                                                                         .436
                                                                                 .428
 16.00 224.99 26.839
                       2.339
                                        4.079
                                               2.876
                                                       4.090
                                                                3.933
                                                                         .144
                                                                                 443
 13.99 224.99 27.683
                      2.261
                              1.381
                                        4.145
                                               3.037
                                                       3.784
                                                                3.647
                                                                         .318
                                                                                 .543
 12.00 224.99 27.963
                       1.988
                              1.140
                                       3.996
                                               2.979
                                                      3.681
                                                                3.158
                                                                         .421
                                                                                 .440
10.01 224.99 28.748
                       1.825
                               .913
                                       4.081
                                               3.001
                                                       3.746
                                                                2.734
                                                                         .246
                                                                                 .848
 7.99 224.99 29.152
                       1.626
                                .548
                                       4.085
                                               3.119
                                                       3.591
                                                                2.175
                                                                        -.323
                                                                                1.169
 5.99 224.99 29.857
                       1.259
                                .589
                                       4.197
                                               3.056
                                                       3.527
                                                                1.520
                                                                       -.079
                                                                                 .846
                                .351
 3.98 224.99
              29.796
                       1.141
                                       4.105
                                               3.085
                                                       3.515
                                                                1.394
                                                                         .098
                                                                                 .946
 2.00 224.99 29.800
                        .888
                                .052
                                                                .202
                                       3.998
                                               3.070
                                                       3.618
                                                                        -.168
                                                                                 .551
   .00 224.99 29.747
                                      4.016
                        .501
                                .053
                                              3.040
                                                       3.590
                                                                -.095
                                                                        -.005
                                                                                1.157
C FILENAME= H904A001.A 1
```

```
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
C 10 : No. of data points
                                                                 u'v'
                                                                                  W 1 11 1
                                                                          77 1 37 1
                                        SIG(u') SIG(v') SIG(w')
                11
Су
         ×
                        4.314 16.709
                                                3.343
                                                                 2.597
                                                                         3.432
                                                                                  .093
        1.50 23.082
                                       2 921
                                                        4.271
13.49
                                                                  .778
                                                                         1.769
                                                                                 - 314
                       4.397 18.023
                                        2.315
                                                2.789
                                                        2.714
13.01
        1.50 23.360
                       4.465 18.403
                                        2.093
                                                2.641
                                                        2.062
                                                                  .167
                                                                         1.068
                                                                                 -.135
        1.50 23.590
 12.51
                                                                                 -.255
 12.01
        1.50
              23.866
                       4.534
                              18.584
                                        2.082
                                                2.561
                                                        1.871
                                                                 -.177
                                                                          .721
                                                                                 -.504
        1.50 23.969
                       4.684 18.259
                                       2.126
                                                2.471
                                                        1.882
                                                                 -.203
                                                                         -.120
 11.19
                                                                 - 146
                                                                       -1.272
                                                                                 -.606
                                                2.359
                                                        2.193
              24.486
                       5.006 17.012
                                        2.257
 10.40
        1.50
                       5.621 15.212
4.686 12.362
                                                        2.206
                                                                 -.605 -1.233
                                                                                  .236
        1 50
              24,450
                                        2.305
                                                2.161
  9.60
                                                                          .490
                                                        2.370
                                                                -1.259
                                                                                 2.533
                                        3.733
                                                2.259
               20.948
  8.20
         1.50
                                                                          .186
                                                                                 1.840
                               9.054
                                        4.206
                                                2.623
                                                        3.262
                                                                -2.198
              14.143
                       2.309
  6.99
        1.50
                                6.459
                                        3.848
                                                2.353
                                                        3.437
                                                                  .000
                                                                          -.006
                                                                                 -.986
                       -.018
  6.01
         1.50
               8.236
C FILENAME= H904A010.A 1
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm
  LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
   9 : No. of data points
                                                                 u'v'
                                                                          77 1 W 1
                                                                                  w'u'
                                        SIG(u') SIG(v') SIG(w')
Су
                 TT
                          V
                                 W
         ×
                                                                10.157
                                                                         7.012
                                                                                  .491
             11.869
                        6.507
                               6.742
                                        4.818 5.519
                                                        5.357
 18.00
         9.99
                                       4.651
                                                                10,107
                                                                         4.748
                                                                                 2,156
         9.99 20.607
                       7.249 11.457
                                                4.771
                                                        4.714
 16.00
                                                                          .467
        9.99 24.260
                       6.700 14.925
                                        2.490
                                                2.885
                                                        2.583
                                                                  . 655
                                                                                  . 615
 13.99
                                                                 -.810
                                                                         -.874
                        6.623 14.300
                                        2.537
                                                2.377
                                                        2.689
 13.02
       10.00 23.825
                                                                 -.532 -1.038
 11.98 10.00 21.971
                        6.521 11.812
                                        2.935
                                                2.160
                                                        2.923
                                                                                 2.698
                                        3.318
                                                2.087
                                                        2.554
                                                                  .266
                                                                         -.276
                                                                                 2.311
 11.01 10.00 20.069
                       5.922
                               9.122
                                                                         -.015
                                                                                 1.768
                        4.729
                                7.363
                                        3.549
                                                2,281
                                                        2.364
                                                                 1.207
 10.00
       10.00
               17.664
                                                                 2.823
                                                                         -.235
                                                                                  .955
  9.01 10.00 14.719
                       2.832
                                5.776
                                        3.750
                                                2.525
                                                        2.511
                                                                                 -.229
                                        4.600
                                                3.580
                                                        2,711
                                                                 5.995
                                                                         -.287
  8.01 10.00 11.488
                        .219
                                4.845
C FILENAME= H904A025.A 1
C H2 FLAME; d=9.45, d=10.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm
  LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
C 15 : No. of data points
                                                                          v'w'
                                                                                  w'u'
                                        SIG(u') SIG(v') SIG(w')
                                                                 u'v'
                 U
                                  W
Су
         ×
                                3.635
                                        4.529
                                               5.512
                                                        4.682
                                                                 8.266
                                                                         4.909
                                                                                  .760
 24.00 25.00 10.174
                        5.371
                                                        4.758
                                                                12.086
                                                                         5.151
                                                                                 1.589
 23.00 25.00 12.264
                        5.648
                                4.555
                                        4.925
                                                5.647
                                                5.499
                                                        4.805
                                                                12.644
                                                                                 3.006
       25.00 14.730
                        6.184
                                5.621
                                        5.284
                                                                          5.110
 22.00
                                        5.049
       25.00 17.235
                                               5.377
                                                                12.373
                                                                          5.775
                                                                                 2,605
 21.00
                        6.310
                                6.540
                                                        4.856
                                                                         5.875
                                                                                 3.163
 20.00 25.00 18.966
                       5.782
                                7.264
                                        5.136
                                               5.327
                                                        4.647
                                                                12.743
                      5.871
5.398
 19.00 25.00 21.654
                                8.309
                                        4.575
                                               4.991
                                                        4.172
                                                                10.243
                                                                          4.368
                                                                         3.590
                                                4.733
                                                        3.864
                                                                 7.160
                                                                                 2.558
 18.01
       25.00
              22.903
                                8.775
                                        3.951
                                        3.478
                                                4.305
                                                        3.338
                                                                 3.950
                                                                         2.338
                                                                                 1.897
 16.98 25.00 23.783
                       4.820
                                9.190
                       4.032
                                9.194
                                        3.232
                                                3.786
                                                        2.999
                                                                 1.097
                                                                         1.204
                                                                                 1.981
 16.01 25.00 23.529
                                                                                 2.437
               22.860
                        2.826
                                8.957
                                        3.385
                                                3.390
                                                        2.885
                                                                  .417
                                                                          .462
 14.99
       25.00
                                                                  .030
                                                                                 3.646
                       1.676
                                8.273
                                        3.884
                                                3.077
                                                        2.870
                                                                          .410
              20.294
 14.01
       25.00
                        .058
                                                                                 3.098
       25.00
              18.544
                                7.933
                                        3.920
                                                2.870
                                                        2.867
                                                                 -.011
                                                                         -.333
 13.01
                                        4.515
                                                3.112
                                                        3.039
                                                                 1.290
                                                                         -.537
                                                                                 2.723
       25.00
               14.892
                       -1.834
                                7.418
 12.00
                                        4.964
                                                4.683
                                                        3.635
                                                                 -.410
                                                                          -.493
                                                                                 1.481
                                7.182
 11.01
       25.00 10.664
                      -3.246
                                                                         -.503
 10.99 25.00 10.356 -3.619
                                                        3.449
                                                                 2.058
                                                                                  . 473
                                6.979
                                        5.020
                                                4.034
C FILENAME= H904A050.A 1
С
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm
  LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C
  D090894
C 14 : No. of data points
                                                                          v'w'
                                                                                  w'u'
                                 W
                                        SIG(u') SIG(v') SIG(w')
                                                                  u'v'
                U
                         V
Су
         x
                                                                                 1.433
                                4.406
                                                                 5.925
                                                                         3.532
 26.00
        50.01 15.219
                        4.137
                                        4.004
                                                4.189
                                                        3.955
                                        3.941
                                                4.096
                                                        3.555
                                                                 4.716
                                                                         2.599
                                                                                 1.713
 24.00 50.01 17.010
                       3.408
                               5.028
                                5.092
                                        3.833
                                                4.059
                                                        3.405
                                                                 3.758
                                                                         2.871
                                                                                 1.528
                       2.477
 22.00 50.01 17.238
       50.01 18.078
50.01 17.421
                                5.565
                                        3.431
                                                3.717
                                                        3.215
                                                                 2.334
                                                                          2.513
                                                                                  1.219
 20.00
                       1.514
                        .313
                                5.946
                                        3.369
                                                3.507
                                                        3.170
                                                                 1.294
                                                                          2.604
                                                                                  .754
 18.00
                                                                  .658
                                                                                   .468
                                                                         2.031
        50.01 16.176
                       -.975
                                6.054
                                        3.230
                                                3.104
                                                        3,058
 15.99
 15.01 50.01 15.368 -1.446
14.01 50.01 14.479 -1.859
                                                        2.928
                                                                  -.394
                                                                          1.965
                                                                                   .380
                                6.139
                                        3.263
                                                3.030
                                                                 -.570
                                                                                  .331
                                                                         2.433
                                5.912
                                        3.238
                                                2.928
                                                        2.996
```

```
13.00 50.01 13.916 -2.282 5.914
                                      3.209 2.858
                                                       3.075
                                                              -.551 2.452
                                                                                .653
 12.00 50.01 13.259 -2.571
                              5.828
                                       3.311
                                              2.865
                                                       3.115
                                                               -.812
                                                                       2.453
                                                                                .336
 11.01
        50.01
              13.101
                      -2.861
                               5.711
                                               2.925
                                       3.222
                                                       3.296
                                                               -.274
                                                                       2.681
                                                                                . 606
  9.99 50.01 12.806
                      -3.023
                               5.507
                                       3.454
                                               3.063
                                                       3.784
                                                               -.033
                                                                       2.901
                                                                                .793
  9.00 50.01 13.839 -3.050
                               5.712
                                       4.390
                                               4.386
                                                       5.245
                                                               3.731
                                                                       3.462
                                                                               2.636
  8.00 50.01 19.203 -1.673
                               6.459 10.056
                                                              40.248 12.358
                                               8.184
                                                       8.947
                                                                               7.157
C FILENAME= H904A075.A 1
C H2 FLAME; d=9.45, d=16.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
   18 : No. of data points
         x
                 Ü
                        V
                                 W
                                       SIG(u') SIG(v') SIG(w')
                                                               u'v'
                                                                       VIWI
                                                                                W 111
 26.00 75.00 15.188
                       2.058
                               3.542
                                       3.012 3.078 2.694
                                                               1.706
                                                                       1.760
                                                                                .696
 24.00 75.00 15.540
22.00 75.00 15.453
                      1.576
                              3.886
                                       2.824
                                               2.957
                                                      2.630
                                                               1.041 1.414
                                                                               582
                                                     2.544
                       1.129
                               4.230
                                       2.729
                                              2.889
                                                               .865 1.438
                                                                               .356
 21.00 75.00 15.426
                        . 968
                               4.454
                                       2.657
                                               2.920
                                                      2.428
                                                                .825
                                                                       1.531
                                                                                .563
 20.00 75.00 14.709
                      1.163 4.415
                                                                .040 1.387
                                       2.692
                                              2,825 2,433
                                                                               .457
 19.00 75.00 15.248
18.01 75.00 14.981
                       .598
                              4.600
                                       2.590
                                             2.749 2.420
                                                                .348 1.556
                                                                               .342
                        .442
                               4.696
                                       2.549
                                              2.678 2.320
                                                                .191 1.382
                                                                               .394
 15.99 75.00 14.847
                        .100
                              4.910
                                       2.448
                                              2.617
                                                      2.362
                                                                .341
                                                                      1.494
                                                                               -642
 13.99 75.00 14.754
                                             2.673 2.596
                      -.149
                              5.099
                                       2.606
                                                                .720
                                                                       1.773
                                                                               .700
 11.99 75.00 15.110 -.740
11.01 75.00 15.588 -1.046
                              5.219
                                       2.684
                                             2.679 2.819
                                                                .794 2.192
                                                                               .946
                               5.193
                                       3 134
                                              2.846 3.231
                                                               1.567
                                                                      2.392
                                                                              1.422
  9.99 75.00 16.704 -1.226
                               5.203
                                       4.442
                                              3.531
                                                      4.411
                                                               3.587
                                                                      3.566
                                                                              2 417
  9.00 75.00 19.680 -1.141
                              5.300
                                       7,261
                                               4.891
                                                      5.731
                                                              13.437
                                                                       5.938
                                                                              3.989
  8.00 75.00 23.987
                       -.638
                              4.722 10.180
                                              6.695
                                                      7.171
                                                              31.027
                                                                      5.278
                                                                              2,257
  5.99 75.00 33.640
                       -.506
                               4.008
                                     13.283
                                              9.062
                                                      9.837
                                                              53,963
                                                                      7.771 -1.539
                               3.552 14.282
  5.01 75.00 38.962
                       -.199
                                             10.099 10.819
                                                              64.465
                                                                     12.332
                                                                              2.082
  4.00 75.00 42.967
                               3.062 14.997 10.452 11.345
                      -.603
                                                              61.910
                                                                     12 893 -2 989
  3.02 75.00 46.444 -1.122
                               3.046 15.090 10.936 11.528
                                                              57.528 10.960 -8.503
C FILENAME= H904A150.A 1
C
C H2 FLAME; d=9.45, d=10.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm
  LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
   D090894
C 14 : No. of data points
        x
                IJ
                                W
                                      SIG(u') SIG(v') SIG(w')
                                                                u'v'
                                                                       v'w'
                                                                               w'u'
 26.00 149.99 13.408
24.00 149.99 13.800
                        .667
                             2.366
                                             1.706 1.646
                                                               .991
                                     1.843
                                                                       .573
                                                                               .179
                                                    1.700
                        .464
                               2.547
                                      1.876
                                              1.700
                                                                .803
                                                                       .602
                                                                               .222
 22.00 149.99 14.092
                              2.567
                        .304
                                      1.905
                                              1.621
                                                      1.684
                                                                .779
                                                                       .669
                                                                               .242
 20.00 149.99 14.540
                       .122
                              2.668
                                                     1.773
                                      2.056
                                             1.694
                                                                .802
                                                                       .862
                                                                               .203
 18.00 149.99 14.984
                                                     1.863
                       -.070
                              2.750
                                      2.248
                                              1.739
                                                               .817
                                                                       .766
                                                                               .272
 16.00 149.99 15.787
                              2.898
                      -.250
                                      2.855
                                              1.895
                                                      2.254
                                                              1,271
                                                                      1.053
                                                                               .804
                                                     2.807
 13.99 149.99 17.387
                       -.305
                              2.953
                                      4.072
                                              2.500
                                                              3.080
                                                                       .870
                                                                               . 698
                             3.005
 12.00 149.99 20.031
                      -.103
                                     5.655
                                              3.492
                                                     3.698
                                                              8.605
                                                                      1.612
                                                                              1.361
 10.01 149.99 22.739
                       .021
                                                     4.341
                              2.605
                                      6.404
                                              4.085
                                                              10.916
                                                                      2.016
                                                                              1.349
 7.99 149.99 25.972
                       .291
                              1.911
                                      7.078
                                              4.554
                                                      4.850
                                                              12.699
                                                                       .963
                                                                             -1.042
  5.99 149.99 28.282
                       .162
                              1.276
                                      7.130
                                              4.834
                                                      5.276
                                                                       .979
                                                              12.761
                                                                               .233
  3.98 149.99
              30.074
                       -.005
                              1.083
                                      6.923
                                              5.090
                                                      5.351
                                                              9.854
                                                                       .571
                                                                              1.121
  2.01 149.99 31.963
                      -.331
                               .764
                                      6.952
                                              5.187
                                                      5.429
                                                              6.967
                                                                       .557
                                                                               .986
   .00 149.99 32.691
                      -.437
                               .549
                                      6.828
                                             5.221
                                                      5.510
                                                              4.119
                                                                       .532
                                                                              -.820
C FILENAME= H904A225.A_1
  H2 FLAME; d=9.45, d=10.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm
  LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
C 14 : No. of data points
                       V
                U
                                W
                                      SIG(u') SIG(v') SIG(w')
                                                              u'v'
                                                                       v'w'
                                                                               w 111 1
26.00 224.99 13.327
                       -.001
                             1.542
                                      2.076
                                             1.437
                                                     1.736
                                                              1.007
                                                                       .605
                                                                               465
 24.00 224.99 13.708
                      -.081
                             1.606
                                      2.213
                                              1.438
                                                      1.797
                                                              1.053
                                                                       .614
                                                                               .472
 22.00 224.99 14.261
                             1.730
                      -.181
                                     2.430
                                             1.492
                                                     1.929
                                                              1.139
                                                                       .661
                                                                               . 692
20.00 224.99 14.934
                      -.290
                              1.761
                                      2.926
                                              1.637
                                                     2.172
                                                              1.776
                                                                       .714
                                                                               .880
18.00 224.99 15.984
                      -.332
                              1.739
                                      3.497
                                              1.848
                                                      2.334
                                                              2.568
                                                                       .836
                                                                              1,208
15.99 224.99 17.101
                       -.366
                             1.702
                                     4.063
                                              2.103
                                                     2.504
                                                              3.646
                                                                       .931
                                                                              1.538
 13.99 224.99 19.012
                      -.096
                              1.779
                                     4.644
                                              2.607
                                                      2.898
                                                              5.454
                                                                      1.064
                                                                              1.708
11.99 224.99 20.059
                       -.196
                              1.484
                                                                       .785
                                      4.883
                                              2.744
                                                      3.092
                                                              5.822
                                                                              1.421
 9.99 224.99 21.887
                       .041
                             1.328
                                      4.979
                                              3.082
                                                     3.262
                                                              6.337
                                                                       -670
                                                                              1.721
```

```
.222
                               .862
                                                              5.740
  7.99 224.99 23.482
                                     4.920 3.228
                                                      3.447
                                                                      .203
                                                                              1.641
                                     4.746 3.304
                                                      3.554
                                                              4.804
                                                                      -.251
                                                                             1.140
                      -.080
                               .816
  5.99 224.99 24.273
                                                                      .130
                                                              3.357
                                                                             1.786
                               .509
  3.98 224.99 25.257
                       -.020
                                      4.666
                                              3.320
                                                      3.518
  2.01 224.99 25.998
                       .063
                                .282
                                      4.656
                                              3.463
                                                      3.575
                                                              2.323
                                                                      -.042
                                                                              1,905
                                                                            1.819
                                                                      .114
   .00 224.99 26.145
                       -.099
                                .119
                                      4.573
                                              3.400
                                                      3.556
                                                               . 953
C FILENAME= H904A001.E 1
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
   8 : No. of data points
                                      SIG(u') SIG(v') SIG(w') u'v'
                                                                       v'w'
                                                                              w 111 1
                                W
               IJ
        x
                                               .213
                                                     .360
                                                              -.010
                                                                       .013
                                                                               .010
                      -.205
                              .074
 26.00
       1.50
              4.059
                                       .269
              3.970
                                               .234
                                       .297
                                                      .392
                                                              -.019
                                                                       .008
                                                                               .005
 24.00
        1.50
                      -.249
                               .051
                                               .245
                                                      .406
                                                              - .021
                                                                       .015
                                                                              .007
 22.00
               3.908
                      -.308
                                .071
                                       .340
        1.50
                                               .293
                                                      .417
                                                              -.036
                                                                       .017
                                                                               .009
 20.00
       1.50
              3.758
                      -.413
                               .095
                                       .399
                               .149
                                       .532
                                               .436
                                                      .524
                                                              -.053
                                                                       .030
                                                                              .015
 18.00
       1.50
              3.490
                      -.541
                              1.059
                                      1.240
                                              1.685
                                                      1.943
                                                              -.200
                                                                       .266
                                                                              -.069
 16.00
        1.50
               3.676
                      -.714
                       .319
              8.295
                              6.321
                                      4.059
                                              4.649
                                                      5.642
                                                              8.761
                                                                      3.859
                                                                              3.092
 15.01
        1.50
                                                             14.089
                                                                              2.714
                                                      6.102
                                                                      4.667
             19.333
                       .471 11.898
                                     5.350
                                              5.227
 14.01
       1.50
C FILENAME= H904A010.E 1
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm
  LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
C 8 : No. of data points
                                      SIG(u') SIG(v') SIG(w') u'v'
                                                                      v'w'
                                                                              w'u'
               U
                                W
Су
        x
                                                    .398
                               .050
                                      .348
 26.00 10.00
               4.040
                       -.208
                                              .336
                                                              -.011
                                                                      .017
                                                                              .026
                                                      .441
                                               .448
                     -.216
                               .046
                                       .437
                                                              -.034
                                                                       .026
                                                                               .040
 24.00 10.00
              4.021
                               .055
                                                      .605
                                                                       .073
              3.990
                                       .667
                                               .775
                                                              -.088
 22.00 10.00
                      -.213
                      -.210
                                     1.268
                                             1.788
                                                      1.426
 20.00 10.00
               4.478
                               .589
                                                              -.123
                                                                       .219
                                                                              -.026
                                              4.915
                              5.681
                                                      5.029
                                                             10.335
                                                                      7.185
                                                                              4.276
 18.00 10.00
               9.951
                       1.952
                                      4.565
                      3.364 10.529
3.015 12.375
                                             5.585
4.942
                                                      4.945
                                                             14.384
                                                                              2.964
                                      5.489
                                                                      7.623
 16.00 10.00 19.425
                                      4.847
                                                      4.588
                                                              9.674
                                                                      5.174
                                                                              1,268
 15.01 10.00
              22.876
                      2.092 14.117
 14.00 10.00 24.350
                                             4.213 3.869
                                     4.002
                                                              5.877
                                                                      3.285
                                                                              . 453
C FILENAME= H904A025.E 1
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
C 7 : No. of data points
                                      SIG(u') SIG(v') SIG(w') u'v'
                                                                      v'w'
                                                                              w'u'
Су
                        V
                                W
              IJ
        x
               4.732
                       -.420
                               .506
                                      1.588
                                              2.027
                                                     1.633
                                                               .227
                                                                      .373
                                                                             -.007
 26.00 25.00
              7.272
                       .282
                                                              5.231
                              2.000
                                      3.257
                                              3.748
                                                     3.375
                                                                      3.248
 24.00 25.00
                                            5.069
                                                      4.467
                                                                      6.021
 22.00 25.00 11.677
                      1.349
                               4.525
                                      4.903
                                                             12,122
                                                                              4.365
                                              5.543
                                      5.421
                                                      4.672
                                                                              4.024
 20.00 25.00 16.875
                      2.115
                               6.431
                                                             15.795
                                                                      6.550
                                                             11.875
                                                                      4.705
                                                                             1.548
                      1.351
                               7.661
                                      4.846
                                             5.387
                                                      4,255
 18.00 25.00
              20.700
                       .118
                                             4.956 3.660
4.075 3.409
             22.147
                              8.531
                                      4.250
                                                              8.395
                                                                      3.773
                                                                             1.487
 15.99 25.00
                                                              3.292
 13.99 25.00 20.203 -2.522
                              8.221
                                      4.226
                                                                      2.476
                                                                             2.256
C FILENAME= H904A050.E 1
C H2 FLAME; d=9.45, d=16=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
C 11 : No. of data points
                                      SIG(u') SIG(v') SIG(w') u'v'
                                                                       v'w'
                U
                        V
                                W
  v
 26.00 50.00 13.409
                      1.453
                              3.611
                                     4.182 4.225 3.648
                                                              8.303
                                                                      3.409
                                                                             1.870
 24.00 50.00 15.377
22.00 50.00 16.056
                     1.125
                              4.069
                                      4.064
                                             4.230
                                                     3.570
                                                              7.338
                                                                      3.693
                                                                              1.940
                                             4.140
                      .535
                               4.297
                                      4.142
                                                      3.416
                                                              6.520
                                                                      3.638
                                                                              2.230
 20.00 50.00 16.525 -.325
                              4.916
                                      3.861
                                              3.873
                                                     3.259
                                                             4.543
                                                                      3.220
                                                                             1.055
                                                                              .704
                              5.335
 18.00 50.00 15.904 -1.162
                                      3.745
                                              3.691
                                                     3.147
                                                              2.174
                                                                      3.616
 17.00 50.00 15.217 -1.674
16.01 50.00 14.411 -1.853
                                              3.495
                                                      3.132
                                                              1.757
                                                                      3.291
                                                                               .164
                               5.560
                                      3.656
                                                      3.043
                                                              .426
                                                                               .365
                              5.763
                                      3.703
                                              3.271
                                                                      2.877
 14.99 50.00 13.427 -2.269
                              5.807
                                      3.814
                                              3.172
                                                      3.040
                                                              -.651
                                                                      3.038
                                                                               .274
                              6.028
                                      3.717
                                              3.179
                                                      2.967
                                                             -1.480
                                                                      2.664
                                                                               .098
 14.01 50.00 12.583 -2.186
                                              3.044
              11.996 -2.639
                              5.989
                                      3.654
                                                      2.936
                                                             -1.883
                                                                      3.034
                                                                               .274
 13.00 50.00
 12.00 50.00 11.250 -2.506 5.960
                                              3.027
                                     3.681
                                                     3.117
                                                             -2.336
                                                                      3.046
                                                                              .413
```

```
C FILENAME= H904A075.E 1
   H2 FLAME; d=9.45, d=10.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894 ·
C 15 : No. of data points
                  IJ
          х
                                  W
                                        SIG(u') SIG(v') SIG(w')
                                                                  11 1 17 1
                                                                          77 T W I
                                                                                   w'u'
 26.00 75.00 14.578
                          .992
                                3.249
                                        2.988
                                                 3,101
                                                        2.646
                                                                  2.550
                                                                          1.893
                                                                                   .686
 24.00
        75.00 14.496
                        1.206
                                3.508
                                         3.062
                                                 3.121
                                                         2.497
                                                                  .587
                                                                          1.686
                                                                                   . 368
 22.00
        75.00
               14.743
                         .630
                                3.959
                                        2.776
                                                        2.489
                                                2 987
                                                                   .748
                                                                          2.031
                                                                                  -.027
 20.00 75.00 14.731
                         444
                                4.205
                                        2.704
                                                 2.816
                                                        2.329
                                                                   .774
                                                                          1.637
                                                                                  -.069
 19.00 75.00 14.327
                        -.058
                                4.362
                                        2.757
                                                 2.807
                                                        2.400
                                                                  .169
                                                                          1.792
                                                                                  .099
 18.01
        75.00
               13.978
                         .368
                                4.545
                                        2,660
                                                2.775
                                                        2.327
                                                                  -.245
                                                                         1.368
                                                                                  .079
 17.00
        75.00 13.872
                        -.159
                                4.571
                                        2.653
                                                 2.699
                                                        2,298
                                                                  .325
                                                                         1.678
                                                                                   .195
                        -.225
 16.00 75.00 13.727
                                4.787
                                        2.589
                                                2.649
                                                        2.302
                                                                   .080
                                                                         1.901
                                                                                   .252
 15.01 75.00 13.609
                                4.889
                        -.402
                                        2.667
                                                2.614
                                                        2.338
                                                                   .432
                                                                         2.158
                                                                                  . 413
 14.01
        75.00 13.585
                        -.393
                                4.972
                                        2.681
                                                2.574
                                                        2.388
                                                                   .301
                                                                         1.786
                                                                                  .776
 13.01 75.00 13.805
                        -.533
                                5.044
                                        2.854
                                                2.648
                                                        2.708
                                                                   .898
                                                                         2.101
                                                                                  .617
 12.00 75.00 13.998
                        -.620
                                5.185
                                        2.969
                                                2.755
                                                        2.824
                                                                   .693
                                                                         2.583
                                                                                  1.052
 11.01 75.00 14.621
                        -.912
                                5.046
                                        3.327
                                                2.924
                                                        3.249
                                                                 1.908
                                                                         3.399
                                                                                  1.397
  9.99
        75.00 15.698 -1.263
                                4.972
                                        4.275
                                                3.300
                                                        3.956
                                                                  2.714
                                                                          3.710
                                                                                  1.299
  9.01 75.00 17.812 -1.279
                               4.517
                                        6.010
                                                4.159
                                                       5.104
                                                                  6.613
                                                                        5.095
                                                                                   .284
C FILENAME= H904A150.E 1
  H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm
C
  LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
  D090894
   6 : No. of data points
         x
                 IJ
                          V
                                  W
                                        SIG(u') SIG(v') SIG(w')
                                                                  u'v'
                                                                          v'w'
                                                                                  w'u'
 26.00 150.00 13.238
                         .609
                                2.382
                                        2.077
                                                1.771
                                                        1.693
                                                                 1.118
                                                                          .832
                                                                                  -- 047
 24.00 150.00
               13.756
                         .483
                                2.433
                                                1.752
                                        2.041
                                                        1.602
                                                                 1.073
                                                                          .669
                                                                                  -.194
 22.00 150.00 14.175
                         .369
                                2.487
                                        2.075
                                                1.755
                                                        1.733
                                                                  .971
                                                                          .933
                                                                                  -.026
 18.00 150.00 15.538
                         .146
                                2.760
                                        2.951
                                                1.967
                                                        2.248
                                                                  - 984
                                                                         1.159
                                                                                  -.308
 16.00 150.00
               16.465
                         .085
                                2.837
                                        3.395
                                                2.167
                                                        2.397
                                                                 2.387
                                                                         1.145
                                                                                  .078
 13.99 150.00 19.371
                        .367
                                2,666
                                        5.121
                                                3.070
                                                        3.262
                                                                 6.697
                                                                         1.356
                                                                                -1.062
C FILENAME= H904A225.E 1
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm
   LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
  D090894
C 10 : No. of data points
                 ĪΤ
         ×
                          37
                                 W
                                        SIG(u') SIG(v') SIG(w')
                                                                 u'v'
                                                                          v'w'
                                                                                  w'u'
 26.00 224.99 13.387
                        -.087
                                1.383
                                        2.180
                                                1.456
                                                        1.682
                                                                  .840
                                                                          .591
                                                                                  -.016
 24.00 224.99 14.520
                        .066
                                1.585
                                        2.946
                                                1.699
                                                        2.116
                                                                 1.916
                                                                         1.033
                                                                                  .508
 22.00 224.99 14.599
                        -.284
                                1.403
                                        3.007
                                                1.732
                                                        1.984
                                                                 1.693
                                                                          .933
                                                                                  -.023
 20.00 224.99 16.277
                        -.033
                               1.525
                                        3.714
                                                2.083
                                                        2.247
                                                                 2.582
                                                                          .956
                                                                                 -.452
 18.00 224.99 18.222
                         .121
                                1.356
                                        4.238
                                                2.497
                                                        2.575
                                                                 3.895
                                                                         1.157
                                                                                 -.373
 15.99 224.99 19.497
                         - 268
                                1.300
                                        4.312
                                                2.750
                                                        2.816
                                                                 4.691
                                                                          .602
                                                                                -1.202
 13.99 224.99
              21,110
                         .512
                                1.084
                                        4.545
                                                2.868
                                                        2.896
                                                                 4.902
                                                                          .688 -1.482
 11.99 224.99
              20.812
                         .165
                                1.120
                                        4.659
                                                2.791
                                                        2.891
                                                                 4.945
                                                                          .826
                                                                                -1.365
 10.00 224.99
                                 .809
              22.260
                         .085
                                        4.558
                                                2.850
                                                        3.160
                                                                 3.909
                                                                          .409
                                                                                -1.558
  8.00 224.99 23.356
                         .271
                                 .935
                                        4.489
                                                2.983
                                                        3.055
                                                                 3.414
                                                                          .263 -1.725
C FILENAME= H904AAX.J 1
   H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; y=0 mm
  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
  D090894
  22 : No. of data points
         x
                 U
                        V
                                 W
  У
                                        SIG(u') SIG(v') SIG(w')
                                                                 u'v'
                                                                          v^1w^1
   .00
        1.50 129.999
                         .001
                                -.010
                                        6.044
                                                4.963
                                                        4.655
                                                                 1.798
                                                                         1.092 -1.129
   .00 10.00 127.485
                                .297
                       -.770
                                        6.657
                                                5.202
                                                        4.844
                                                                 3.154
                                                                          .166
   .00 20.00 124.431 -1.481
                                 .603
                                       9.221
                                                7.220
                                                        6.678
                                                                 9.466
                                                                          .617 -3.795
   .00
       30.00 115.284
                                      13.761 11.219
                     -1.012
                                1.002
                                                       10.029
                                                                22.822
                                                                         6.621 -15.054
   .00 40.01 102.083
                                1.189 17.802 13.859
                        .407
                                                       12.962
                                                                31.422
                                                                        4.919 -25.531
   .00 50.00 86.809
                       1.463
                               1.513 18.629 14.467
                                                       13.805
                                                                35, 162
                                                                        -1.744 - 31.176
   .00
        60.01
              74.397
                        .898
                                .903 16.595 12.783 13.536
                                                                28.557
                                                                        2.592 -10.466
       70.00 63.127
   .00
                         .461
                               1.156 13.970 10.985 12.166
                                                                17.959
                                                                        4.042 -10.422
```

```
.186 11.312 9.300 10.674 13.817
.313 9.788 7.888 9.562 8.006
                                                                             -.200 -6.432
   .00 80.00 58.433 1.044
                                                                    8.006
                                                                            1.062 -4.962
                         .778
   .00 90.00 53.218
                                  .313
                                         9.788
                                                 7.154
   .00 100.00 49.522
                          .874
                                 -.121
                                          8.853
                                                           8.349
                                                                   8.658
                                                                             1.062
                                                                   4.963
                                                                             .175
                                                           7.317
                                                                                     -.896
                         .891
   .00 110.00 46.415
                                 -.047
                                         7.930
                                                 6.128
                                         7.222 5.658
6.859 5.204
                          .989
                                                                                      . 920
   .00 120.00 43.641
                                 -.094
                                                           6.657
                                                                    2.693
                                                                             -.662
                                                                    3.006
   .00 130.00 41.185
                          .594
                                                           6 227
                                                                             - 073
                                                                                      . 604
                                  .112
                                                                             .067
                                                                                      .265
   .00 140.00 39.887
                                 -.172
                                                 4.726
                                                          5.578
                                                                  1.642
                          .542
                                         6.461
                          .599
                                         5.926 4.545 5.292
                                                                   .310
                                 -.080
                                                                              .113
                                                                                      .688
   .00 150.01 37.942
                          .808
   .00 160.00 36.374
                                 -.101
                                         5.582
                                                  4.303
                                                           4.991
                                                                     .467
                                                                             -.095
                                                                                      .768
   .00 170.01 35.142
                          .388
                                  .181
                                         5.032
                                                 3.957
                                                          4.964
                                                                     .795
                                                                             .622
                                                                                      .717
                                                                    -.514
                                                                              .198
                                                 3.867
                                                           4.444
   .00 180.00 33.909
                          .604
                                  .130
                                         4.853
                                                                                      .112
   .00 190.01 32.864
.00 200.01 31.782
                          .454
                                 -.015
                                         4.814
                                                  3.571
                                                           4.022
                                                                    -.789
                                                                              .157
                                                                                      .408
                                         4.419
                                                  3.468
                                                                    -.007
                                                                              .282
                                                                                      .066
                          .433
                                                           4.086
                                 -.054
   .00 224.99 29.833
                                         3.860 2.998
                                                           3.764
                                                                    -.387
                                                                              .015
                                                                                     -.439
                         .438
                                 .150
C FILENAME= H904A001.J 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm
 LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
  D090894
C 12 : No. of data points
                                                                     v'^2w'
                 u'^3
                            v1^3
                                       w'^3
                                                u'^2v'
                                                           v'^2u'
                                                                               w'^2v' w'^2u'
                                                                                                   11112W1
         ×
                                                                      11.002 14.756 47.920 10.085
                                     22.748 198.393 121.994
  4.70
                918.544
                           -18.093
        1.50
       1.50 2494.387
                         168.211
                                      47.573 522.527 368.078
                                                                     -38.829 -5.261 49.791 -158.758
  4.51
                                                                    19.061 -8.305
        1.50 999.423 286.346
                                     37.389
                                                33.622 -94.407
                                                                                          -.111 8.169
  4.30
        1.50 -1564.181
                                     22.161 -367.690 -377.038
33.188 -277.814 -187.966
                                                                                 1.103
                         40.258
-89.448
                                                                      26.229
                                                                                         24,301
                                                                                                   37,480
  4.00
                                                                                 1.230 -34.362 62.294
                                                                      12.954
  3.49
        1.50 -639.083
                                                                      .452 -10.435 -26.193 -28.813
                                     -6.143 -179.434 -139.151
  3.01
        1.50 -314.813 -84.408
                                     -.985 -138.488 -104.819
                                                                       .329 -2.191 -27.639
-.979 -15.576 -42.641
                         -56.934
-43.904
                                                                                                   4.730
        1.50 -268.484
  2.49
              -186.684
                                       5.534
                                               -96.896 -76.692
                                                                                                   -2.171
  2.00
        1.50
                                                                       9.888 -3.852 -20.890 14.014
  1.50
        1.50 -161.111
                         -42,592
                                      8.114
                                               -67.795 -84.332
                                                                               -1.505 -20.031
                                               -63.300
                                                          -71.503
                                                                       7.818
                                                                                                   19.861
        1.50 -147.620
                          -32.839
                                      4.400
  .99
        1.50 -108.408
                                                           -53.774
                                                                        1.410
                                                                                 -.949 -10.834
                                                                                                   18.052
                          -19.924
                                       9.535
                                                -36.163
   .51
                          -1.584
                                               -13.298 -59.830
                                      16.817
                                                                       2.177
                                                                                  .958 -9.395
        1.50 -110.191
                                                                                                  9.992
   . 01
C FILENAME= H904A010.J 2
C H2 FLAME: d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm
C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
  D090894
C 10 : No. of data points
                                                                                w'^2v' w'^2u' u'^2w'
38.239 66.183 -146.811
                                                                     v'^2w'
                           v'^3
                u'^3
                                      w'^3
                                                           v'^2u'
                                                u'^2v'
Су
        x
 5.50 10.01 1500.343 519.230 -751.789 973.551 991.074
4.99 10.01 1219.310 144.546 -486.059 497.570 564.509
                           519.230 -751.789 973.551 991.074
                                                                      11.632
                                                                    10.533 58.023 -137.637 -51.916

    4.51
    10.01
    1676.237
    101.148
    -233.420
    266.977
    368.915

    3.99
    10.01
    -539.329
    -93.486
    108.955
    -454.504
    -384.402

    3.42
    10.01
    -2229.229
    -297.130
    381.252
    -724.947
    -628.557

                                                                     50.763 77.499 -38.577
                                                                                                  -9 652
                                                                     -87.574 -47.072 -515.095
                                                                    -70.820 -99.085 -374.746 179.451
  2.71 10.01 -1649.723 -529.960
                                    182.244 -815.823 -667.387 66.059 -140.001 -187.364 239.204
        9.99 -423.350 -182.783
                                       45.287 -243.969 -223.964
                                                                      23.750 -59.153 -81.761
                                                                                                  10.545
  2.01
                                               -75.935 -105.923
                                                                      21.259 -17.382 -36.268
         9.99
              -205.297
                          -65.346
                                       6.829
                                                                                                   34,529
  1.29
                                                                      6.013 -3.279 -18.246 10.107
         9.99 -183.449
                          -34.609
                                     14.655
                                               -54.972 -72.341
   . 61
        9.99 -100.498
                         -15.559
                                     11.564 -18.480 -56.015
                                                                       8.030 -5.441 -16.867 17.205
   .00
C FILENAME= H904A025.J_2
C H2 FLAME; d=9.45, d=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm
  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894
C 13 : No. of data points
                                                                              w'^2v' w'^2u' u'^2w'
                           v'^3
                                                u'^2v'
                                                                      v'^2w'
                 u'^3
                                      w'^3
                                                          v'^2u'
         x
  7.99 25.00 977.075 -158.160 -298.843 133.423 1055.650
                                                                     -14.721 156.822 64.694 -118.765
                                                                     -18.280 245.840 201.293 19.132
  7.00 25.00 871.202 250.997 -659.128 485.428 1059.981
  6.01 25.00 1504.632 483.101 -679.601 978.518
5.49 25.00 1647.525 547.012 -739.568 963.412
                                                                     -80.971 187.501 175.747 -181.917
8.983 69.464 182.307 -93.925
                                                978.518 1047.663
                                                         977.152
  5.00 25.00 2055.079 629.430 -764.984 1170.115 1163.896
                                                                      1.973 10.353 -47.545 -271.702
 4.50 25.00 2216.855 493.959 -949.510 878.142 908.115 -4.232 -198.974 -285.979 -206.187

4.01 25.00 1980.300 335.041 -687.138 584.853 715.398 -18.207 74.973 -198.564 -200.243

3.41 25.00 300.842 -111.593 -308.037 -187.923 122.601 51.605 -85.896 -656.513 -101.360
  2.70 25.00 -1803.820 -388.219 -120.195 -525.472 -502.404 150.973 -73.928 -651.395 63.310
  2.01 25.00 -3528.372 -543.008 193.288 -810.600 -975.761
1.29 25.00 -3221.464 -512.194 166.833 -843.166 -1009.862
                                                                     211.578 -192.569 -768.059 188.437
                                                                      46.397 -69.392 -453.587 152.024
```

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.60 25.00 -1400.272 -343.754 171.918 -699.435 -780.903 64.735 -10.271 -294.230 68.929
.00 25.00 -788.473 -79.021 165.906 -233.221 -466.609 20.953 -74.558 -248.264 140.958
C FILENAME= H904A050.J 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C 11 : No. of data points
  Y X u'^3 v'^3 w'^3 u'^2v' v'^2u' v'^2w' w'^2v' w'^2u' u'^2w' 8.81 49.99 1213.615 -338.572 -234.784 -111.733 956.595 -57.188 85.105 144.566 -59.658 8.20 49.99 1001.521 -583.750 -173.891 -86.589 1079.129 -103.691 89.046 228.786 -25.833
  7.01 49.99 964.263 338.162 -266.494 593.638 676.398 -16.702 64.042 206.536 -66.743 5.99 49.99 1507.126 305.707 -281.496 696.993 911.175 18.155 158.789 200.221 -62.064
  5.99 49.99 1507.126 305.707 -281.496 696.993 911.175 18.155 158.789 200.221 -62.064
5.00 49.99 1570.448 587.548 -198.574 890.884 960.158 79.690 124.887 66.273 -111.979
   5.00 49.99 1570.448 587.548 -198.574 890.884 960.158 79.690 124.887 66.273 -111.979 3.99 49.99 2069.978 537.756 -358.374 663.415 914.544 106.157 144.145 -207.342 -188.758
  2.73 49.99 1707.440 308.915 -356.869 297.901 547.135 -18.711 66.779 -473.488 -21.753
2.01 49.99 1337.915 422.656 -277.936 300.943 624.791 38.799 88.267 -264.224 -63.041
1.29 49.99 276.218 138.511 -285.339 -131.024 59.949 -18.513 -12.054 -742.161 16.112
                   25.660 88.117 -474.264 -221.925 -159.780 111.772 72.104 -603.351 -162.384
    .60 49.99
    .00 49.99 -794.691
                              29.938 -189.332 -239.487 -395.643 -53.545 -108.610 -688.034 16.818
C FILENAME= H904A075.J 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm
C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894
C 11 : No. of data points
C v x u'^3
                                                                              v'^2w' w'^2v' w'^2u' u'^2w'
-21.873 61.130 123.121 -27.709
5.568 81.932 127.139 10.865
                                                      u'^2v' v'^2u'
41.638 432.288
                                 v'^3
                                             w'^3
  9.50 75.00
                               -23.465 -65.924
                   531.809
  8.20 75.00
7.00 75.00
                 395.974 125.791 -78.019 201.979 301.400
  7.00 75.00 602.141 51.170 -222.130 136.022 433.580 6.01 75.00 409.018 176.632 -75.785 217.709 336.319
                                                                                3.241 62.268 90.861 -12.094
                                                                                          44.233
                                                                                -2.051
                                                                                                      64.913 -10.514
  4.99 75.00 504.520 160.756 -68.438 224.582 271.771
                                                                                                     52.185 -21.008
                                                                               20.640
  4.01 75.00
2.72 75.00
                 600.869
737.954
                             205.406 -24.367 164.102 274.595 -42.681 79.662 -11.682 -74.232 134.393 -184.252 185.213 278.497 6.588 44.000 -47.358 -34.056 95.018 -58.835 120.374 241.365 .396 41.363 -99.401 -41.977
                                                                                          44.000 -47.358 -34.056
41.363 -99.401 -41.977
  2.01 75.00 615.494
                                                                                  .396
  1.29 75.00 549.224
.61 75.00 599.583
                              51.938 96.693 85.572 247.444 2.810 11.069 -190.141 -101.023
90.837 -98.389 57.442 209.339 -4.916 -13.656 -211.639 7.398
3.630 -127.781 6.357 188.076 9.584 50.017 -142.312 -63.312
    .00 75.00 538.433
                                                                                9.584 50.017 -142.312 -63.312
C FILENAME= H904A150.J 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm
  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894
  9 : No. of data points
                   u'^3
                                v*^3
                                           w'^3
                                                                 v'^2u'
         х .
                                                      u'^2v'
                                                                                          w'^2v'
                                                                              v'^2w'
                                                                                                    w'^2u'
                                            6.336 21.769
 13.99 150.00
                    88.409
                                17.314
                                                                    38.022
                                                                             -1.616 5.307 21.516 -3.870
                              16.482
 12.00 150.00
                                                       5.637
                  51.915
                                             3.257
                                                                    22.672
                                                                             1.975
                                                                                                    10.103 -4.040
5.090 -7.812
                                                                                            7.856
 10.01 150.00
                              12.475
                  49.379
                                                         .652 20.044
                                            15.470
                                                                                            5.522
                              13.025
  7.99 150.00
                                             7.489
7.154
                   31.907
                                                        1.051 24.658
                                                                                -.829
                                                                                          1.599
                                                                                                       2.508 -2.920
                                                                  8.974
                              7.239
  5.99 150.00
                   14.655
                                                       -6.056
                                                                                          .520
-1.535
                                                                                2.752
                                                                                                     -8.287
                                                                                                                -5.646
                                                                     1.725
                   1.962
                                4.027 10.470 -7.079
  3.98 150.00
                                                                               -1.657
                                                                                                     -6.961
                                                                                                                -6.110
  2.01 150.00
                    9.025
                                2.670
                                                                               -2.484 -2.633 -10.198 -10.916
                                            4.973 1.069
                                                                    5.065
                                            -2.305 2.226
7.307 5.199
  1.00 150.00
                    -4.618
                                 2.686
                                                        2.226
                                                                    -.036
                                                                                .415
                                                                                           .456 -11.408 -10.865
                               3.398
   .01 150.00 3.273
                                                                    -.162
                                                                                  .442
                                                                                           -1.480 -16.259 -9.154
C FILENAME= H904A225.J 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm
C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
   D090894
C 10 : No. of data points
         x
                 u'^3 v'^3
                                           w'^3
                                                       u'^2v'
                                                                              v'^2w'
                                                                 v'^2u'
                                                                                          w'^2v'
                                                                                                    w'^2u'
                                                                                                               u'^2w'
                                                      .059
                               3.213
6.529
 18.00 224.99
                                                                 5.452
8.021
3.092
                    8.629
                                            5.468
                                                                                .055
                                                                                          -1.305 -2.937
                                                                                                               1.445
16.00 224.99
                   14.566
                                            18.224
                                                         4.117
                                                                                 -.004
                                                                                          1.794 2.929
                                                                                                                 -.337
                                                                                          .739
                               3.564
                                            7.045 -1.925
13.99 224.99
                   9.662
                                                                                 .988
                                                                                                       -.074
                                                                                                                 -4.843
                   7.053 1.613 5.031 .527
7.805 1.842 14.391 .148
2.671 .992 5.677 -2.171
12.00 224.99
                                                                   4.634
                                            5.031 .527
                                                                                -1.551
                                                                                            -.399 -1.531 -1.780
10.01 224.99
                                                         .148 5.085
                                                                                .477
                                                                                          -1.147
                                                                                                    -6.187
                                                                                                               -3.632
  7.99 224.99
                                                                    4.382
                                                                                 1.255
                                                                                          -1.259 -1.173
                                                                                                               -1.593
```

```
1.219 -2.278 -4.618
                                                    2.333
  5.99 224.99
              11.018
                       -1.627
                                 3.686
                                          -.484
                                                                           -4.284
                7.750
                        -.989
                               2.024
                                         -1.332
                                                    1.720
                                                             .451 .549
                                                                                    -1.710
  3.98 224.99
                                                                            -2.895
                                                                                     -2.201
                                         -1.375
                                                    2.366
                                                             1.381
                                                                    -1.493
                        -.623
                                  7.522
  2.00 224.99
                4.142
                                                                   -2.147
                                                                           -3.146
                                                                                      . 458
                                                             2.153
                3.945
                        -1.530
                                  9.554
                                           1.106
                                                    2.582
   .00 224.99
C FILENAME= H904A001.A 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm
  LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090493
C 10 : No. of data points
                                                            v'^2w'
                                                                   w'^2v'
                                                                           w'^2u'
                        v'^3
                                         u'^2v'
                                                  v'^2u'
              u'^3
                                 w'^3
Су
        ×
                                                            -8.620 -12.826
                                                                           1.858
                                                                                    -6 755
                                         -13.710 -10.402
               -5.925
                       -23.285
                               -83.472
 13.49
       1.50
                                                                   -6.728
                                         -4.878 -2.859
                                                            -2.921
                                                                             -.375
                                                                                     -1.563
               -1.850
                        -9.462
                               -15.717
 13.01
       1.50
                                                                                     -.482
                                                   -1.533
                                                            -2.616
                                                                    -2.903
                                                                              .381
       1.50
               -.105
                        -8.164
                                 -3.061
                                         -1.330
 12.51
                                 -1.956
                                                   -1,297
                                                            -2.257
                                                                   -1.285
                                                                              .225
                                                                                     -.327
                                          -.475
        1.50
                .171
                        -5.943
 12.01
                                                                     .053
                                                                              .212
                                                                                     -.653
                                           .173
                                  -.682
                                                    -.074
                                                            -1.348
 11.19
       1.50
                -.182
                        -2.405
                                                            -1.547
                                                                     2.229
                                                                            -1.165
                                                                                     -.984
               -.769
                        - . 651
                                 -1,647
                                           1.119
                                                    -.420
 10.40
       1.50
                                                                     .149 -2.538
                                                            -.783
                                                                                     -1.856
                                                   -2.423
               -4.144
                         1.820
                                  .926
                                           2.140
  9.60
        1.50
                                                  -6.896
                                                            -.404
                                                                     .066 -5.885
                                                                                    -6.239
              ~35.480
                        3,120
                                 -5.566
                                          7.283
  8.20
       1.50
                                                            .876
                                -7.746
                                                   -6.035
                                                                     1.198
                                                                            -2.116
                                                                                     3.235
                                          3.307
               -9.735
                        5.240
  6.99
       1.50
                                                                           -2.373
                                          -1.304
  6.01
               4.307
                        -.256
                                6.627
                                                   -3.151
                                                              .797
                                                                     841
                                                                                     6.300
       1.50
C FILENAME= H904A010.A 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
  9 : No. of data points
               u'^3
                        V1^3
                                                  v'^2u'
                                                           v'^2w'
                                                                   w'^2v' w'^2u'
                                                                                     u'^2w'
                                 w'^3
                                         u'^2v'
C
        x
                                                            1.370 15.604
                                                                            3.048
                                                                                    1.249
 18.00
                       -21.878
                               22.540
                                          6.080 -1.053
      9.99
               15.149
                      -63.400
                               -46.111
                                                           -19.694 -12.152 -10.675 -19.312
             -52.885
                                         -46.909
                                                  -44.958
 16.00 9.99
                                         -4.748
                                                            -4.103 -3.065
                                                                            -.375
                                                                                    -1.387
       9.99
              -1.385
                       -14.211
                                -8.908
                                                  -4.110
 13.99
                                           .001
                                                    -.097
                                                            -.463
                                                                    1.453 -3.514
                                                                                    -4.069
 13.02 10.00
              -3.993
                        -4.179
                               -7.836
                                         -1.211
                                                    -.488
                                                             -.310
                                                                    -1.282
                                                                             -.913
                                                                                    -3.439
                        -.222
                                 -.475
 11.98 10.00
              -8.503
                                                             -.042 -1.753
                                                                           -2.701
                                                                                     -3.724
                        -.340
                                  3.332
                                          -2.994
                                                   -2.440
 11.01 10.00
              -17.079
                                                                           -3.701
                                                                                     -1.942
                                 -2.488
                                          -5.148
                                                   -5.293
                                                             -.310
                                                                     -.287
 10.00 10.00
             -15.989
                        -1.134
                                                                           -1.793
-8.716
                                         -13.130
                                                  -11.144
                                                             -.888
                                                                      .422
                                                                                      .500
  9.01 10.00
              -27.138
                        -5.786
                               -1.832
                                 .585
                                         -18.341
                                                  -34.702
                                                             -.254
                                                                     -.781
                                                                                      6.007
  8.01 10.00
              -40.316 -15.348
C FILENAME= H904A025.A 2
C H2 FLAME; d=9.45, d=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
C 15 : No. of data points
               u'^3
                                                           v'^2w' w'^2v' w'^2u'
                                         u'^2v'
                                                 v'^2u'
                                                                                    11 1 ^ 2 w 1
                        v'^3
                                  w'^3
Су
       x
                                                          7.334 19.208 1.407
                                                                                    1.896
                        15.751
                               19.350
                                         15.485 9.112
 24.00 25.00
               28.143
                                         9.058
              19.765
                                                    6.452
                                                             4.694
                                                                     6.174
                                                                             3.471
                                                                                     2.082
 23.00 25.00
                        9.824
                                 6.484
                                           -.639 -10.410
                                                            -1.454 -1.337
                                                                           -1.539
                                                                                     5.145
       25.00
                7.106
                        -8.662
                                 -3.983
 22.00
                                                                           -8.884
                                                           -11.912 -3.984
                                                                                    -9.016
                      -40.500
                               -22.988
                                         -19.761 -25.314
 21.00 25.00
             -29.516
                                                           -9.651 -14.395 -18.837 -10.514
-18.753 -14.263 -18.803 -13.220
                      -30.721
-59.012
             -43.304
                                -25.837
                                         -30.203
                                                  -34.511
 20.00 25.00
                               -29.484
                                         -42.743 -47.637
       25.00
              -58.178
 19.00
                                         -36.616 -43.162 -17.986 -11.454 -12.044
                                                                                    -9.618
 18.01 25.00
             -39.031
                      -46.437
                               -30.429
                      -41.502
                               -14.870
                                                                            -7.704
                                                                                    -8.116
                                                  -28.081
                                                           -10.134 -10.576
             -24.926
                                         -21.814
 16.98 25.00
                                                            -5.939 -3.383 -3.899
                                         -7.959
                                                                                    -5.548
              -14.434
                       -34.318
                                -6.744
                                                  -15.139
 16.01 25.00
                                                   -5.010
                                                            -1.129 -1.147 -4.037
                                                                                    -6.121
             -15.050
                      -22.616
                                -3.679
                                         -3.402
 14.99 25.00
                                                     .100
                                                                            -2.609
                                                                                     -4.757
                                -3.421
                                          -5.376
                                                            -1.124
                                                                     -.747
 14.01 25.00
              -20.698
                       -16.280
                                                                           -1.293
                                          -4.922
                                                    1.046
                                                            -1.586
                                                                     .710
                                                                                    -1.036
 13.01 25.00
              -21.905
                       -13.500
                                 -1.857
                                         -10.749
                                                            -2.982
                                                                     -2.277
                                                                           -5.547
                                                                                    3.035
                                 -4.499
                                                   -8.111
 12.00
       25.00
              -37.943
                       -15.203
                                                                    10.146 -13.087
                                 -2.335
                                          5.851
                                                  -50.609
                                                            1.134
                                                                                     8 127
 11.01 25.00
              -15.850
                       78.862
                                                                     5.868 -12.300
                        13,453
                                  3.657
                                          -2.183
                                                  -22.945
                                                            -4.717
                                                                                     11.965
 10.99 25.00
             -13.486
C FILENAME= H904A050.A 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm
  LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
  D090894
C 14 : No. of data points
                                                                            w'^2u'
                                                                                     u'^2w'
       x u'^3 v'^3
                                 w'^3
                                          u'^2v'
                                                   v'^2u'
                                                            v'^2w' w'^2v'
Су
                                                   -8.459 -3.432 -4.625
                                                                           -2.815 -1.879
                                 -8.777
                                          -4.633
               -2.568
                        -2.218
 26.00 50.01
```

```
24.00 50.01 -11.799
                         -5.122
                                  -9.852
                                            -7.777
                                                     -9.499
                                                               -3.256
                                                                      -6.714
                                                                               ~5.293
                                                                                       ~5.003
 22.00 50.01
              -10.761
                         -1.084
                                  -7.424
                                            -6.959
                                                    -11.043
                                                                      -5.923
                                                               -3.590
                                                                               -5.022
                                                                                       -3.975
 20.00
       50.01
                -9.185
                         -9.749
                                  -8.541
                                            -5.138
                                                    -11.228
                                                               -4.891
                                                                      -4.496
                                                                               -4.877
                                                                                        -3.908
 18.00 50.01
               -11.830
                         -9.245
                                  -10.233
                                            -3.064
                                                     -8.083
                                                               -4.810
                                                                       -4.508
                                                                               -2.785
                                                                                        - 884
 15.99 50.01
                -5.843
                         -6.655
                                  -8.959
                                            -2.698
                                                     -4.773
                                                                      -2.617
                                                               -2.769
                                                                               -3.202
                                                                                        -1.199
 15.01 50.01
               -9.020
                                             .867
                         -3.571
                                  -6.577
                                                     -5.602
                                                               -1.670
                                                                      -1.479
                                                                               -3.375
                                                                                       -3.376
 14.01 50.01
               -10.020
                         -1.545
                                   -8.092
                                             1.257
                                                     -3.334
                                                               -1.742
                                                                      -1.865
                                                                               -3.540
                                                                                       -1.935
 13.00 50.01
                -7.186
                                  -7.561
                          -.185
                                             2.141
                                                     -4.152
                                                               -1.193
                                                                      -1.391
                                                                               -3.447
                                                                                        -2.811
 12.00 50.01
               -12.936
                          3.241
                                   -6.242
                                            3.776
                                                     -3.340
                                                                .994
                                                                        1.382
                                                                               -2.123
                                                                                       -1.842
 11.01 50.01
                -3.329
                          7 539
                                                      .777
                                  -3.254
                                            4.579
                                                                2.383
                                                                        2.798
                                                                                -.946
                                                                                         .125
                         9.681
  9.99 50.01
                 6.082
                                   -.559
                                             3.114
                                                      2.330
                                                               5.152
                                                                                1.600
                                                                        5.756
                                                                                        -1.403
  9.00 50.01
                66.759
                                   40.614
                         63.112
                                            30.534
                                                     39.933
                                                               24.495
                                                                       37.713
                                                                               39.893
                                                                                        11.878
  8.00 50.01 1482.532 554.266 108.120 626.203
                                                    494.268
                                                              85.488 288.449 401.674
                                                                                        17.732
C FILENAME= H904A075.A 2
C H2 FLAME; d=9.45, d=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm
  LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C
C 18 : No. of data points
               u'^3
                         v'^3
         x
                                   w'^3
                                            u'^2v'
                                                     v'^2u'
                                                              v'^2w'
                                                                               w'^2u'
                                                                      w'^2v'
                                                                                        u'^2w'
 26.00 75.00
                 .590
                         -3.416
                                   -1.976
                                            -2.414
                                                     -4.236
                                                              -2.267
                                                                      -2.139
                                                                               -2.196
                                                                                        - 632
 24.00 75.00
                -1.013
                         -1.456
                                  ~4.800
                                           -1.586
                                                     -2.741
                                                               -.902
                                                                      -3.070
                                                                                -.721
                                                                                        -.381
 22.00 75.00
                -.408
                         -2.902
                                  -3.131
                                            -2.390
                                                     -3.300
                                                               -2.032
                                                                      -2.456
                                                                                -.768
                                                                                        -.317
 21.00 75.00
                 .237
                         -3.340
                                  -2.403
                                            -1 896
                                                     -2.666
                                                              -1.502
                                                                      -1.787
                                                                                -.556
                                                                                        -.655
 20.00 75.00
                 -.948
                         -1.819
                                  -2.080
                                            -.909
                                                     -1.776
                                                              -1.622
                                                                      -1.057
                                                                                -.935
                                                                                       -1.398
 19.00 75.00
                 .585
                         -2.369
                                  -2.375
                                            -1.359
                                                     -1.704
                                                              -2.018
                                                                      -2.947
                                                                                -.113
                                                                                        -1.065
 18.01 75.00
               -2.955
                         -2.027
                                  -2.135
                                            -.663
                                                     -1.487
                                                              -1.526
                                                                      -1.455
                                                                                -.147
                                                                                        - 946
 15.99 75.00
                -1.191
                         -2.001
                                  -3.036
                                             ~.381
                                                     -.243
                                                              -1.061
                                                                       -.642
                                                                                -.938
                                                                                       -1.338
 13.99 75.00
                3.261
                         3.248
                                  -4.368
                                             2.775
                                                      1.783
                                                              -1.264
                                                                        .117
                                                                                1.164
                                                                                       -1.385
 11.99 75.00
                5.033
                         3.590
                                  -4.230
                                            1.486
                                                     3 448
                                                               1.457
                                                                         . 491
                                                                                2.645
                                                                                       -1.961
 11.01
       75.00
                23.011
                          5.292
                                  -3.766
                                            5.996
                                                     6.248
                                                               3.694
                                                                       3.568
                                                                                7.754
                                                                                       2.213
                                                                      24.259
  9.99 75.00
              105.041
                         23.111
                                   7.264
                                           24.183
                                                     33.946
                                                              15.162
                                                                               50 218
                                                                                        4.970
                                   42.093 168.146 152.955
  9.00 75.00
              587.502 102.217
                                                              30.742
                                                                       79.041 146.718
                                                                                        7.658
       75.00 1262.213 298.215
  8.00
                                -15.012 435.133 359.142 17.150 151.681 278.394
                                                                                       -2.199
                                                   517.528
  5.99
       75.00
             1524.565
                        511.607
                                 -83.222
                                          539.558
                                                              24.770 203.558 308.123 -67.599
  5.01 75.00 1358.027
                        568.282 -237.542
                                           384.595
                                                    420.032
                                                              48.337
                                                                      222.952
                                                                              251.700 -13.294
  4.00 75.00 1475.883
                                                                      162.566 124.919 -109.576
                        413.008 -267.594 295.475
                                                    259.708
                                                              22.557
  3.02 75.00 1280.919
                       466.983 -212.306 142.659
                                                    135,473
                                                               -.824 150.240 19.238 -106.106
C FILENAME= H904A150.A 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C 14 : No. of data points
            u'^3
Су
                        v¹^3
        x
                                  w'^3
                                           u'^2v'
                                                    v'^2u'
                                                              v'^2w'
                                                                      w'^2v'
                                                                               w'^2u'
                                                                                       บ ' ^ 2 พ '
 26.00 149.99
                -.048
                         -.717
                                   -.820
                                           -.628
                                                    -.565
                                                              -.092
                                                                      -.611
                                                                               -.396
                                                                                         .195
                 .101
 24.00 149.99
                         -.691
                                   -.894
                                            -.390
                                                               -.320
                                                     -.368
                                                                       -.428
                                                                                 .079
                                                                                        -.130
 22.00 149.99
                 .704
                         - 327
                                   -.636
                                            -.477
                                                      -.357
                                                               -.202
                                                                       -.335
                                                                                 .241
                                                                                         . 247
 20.00 149.99
                2.528
                        -.300
                                             .145
                                                      .217
                                   -.604
                                                               .047
                                                                       -.140
                                                                                 .749
                                                                                         .753
 18.00 149.99
                          .535
                6.034
                                   .133
                                             .881
                                                       .968
                                                                .605
                                                                        .274
                                                                                2.207
                                                                                         . 762
 16.00 149.99
                          2.491
               25.246
                                   2.485
                                             4.920
                                                      4.245
                                                               1.794
                                                                       1.747
                                                                                7.544
                                                                                        4.873
                                           22.390 20.418
 13.99 149.99
               89.544
                         9.160
                                   4.978
                                                               -.181
                                                                       7.196
                                                                               19.436
                                                                                         .464
             186.414
 12.00 149.99
                        41.903
                                   3.688
                                                                     18.022
                                         62.390 52.418
                                                               6.030
                                                                               40.489
                                                                                        2.177
                                         61.187
                                                   56.076
 10.01 149.99
               182.300
                         46.459
                                   2.556
                                                               3.951
                                                                      25.547
                                                                               45.144 10.518
 7.99 149.99
              136.887
                         47.434
                                 -10.718
                                           33.851
                                                    44.106
                                                                .318
                                                                      23.042
                                                                               29.638 -7.971
 5.99 149.99
               97.374
                         46.881
                                  -2.409
                                          21.511
                                                     31.553
                                                               1.650
                                                                       22.658
                                                                               15.455
                                                                                        2.219
  3.98 149.99
                67.483
                         28 292
                                  -2.303
                                            5.764
                                                   14.848
                                                              -2.320
                                                                      12.256
                                                                               -.869
                                                                                        9.312
 2.01 149.99
                44.979
                         18.055
                                  -4.916
                                          -10.874
                                                    -3.203
                                                              -1.115
                                                                       5.904
                                                                               -3.168
                                                                                        6.192
   .00 149.99
               26.562
                        16.224 -11.621
                                                   -13.506
                                           -8,923
                                                               -.689
                                                                       5.930 -19.366
                                                                                        3.623
C FILENAME= H904A225.A 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm
  LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
 D090894
C 14 : No. of data points
              u'^3
                       v1^3
       x
                                   w'^3
                                          u'^2v'
                                                    v'^2u'
                                                              v'^2w'
                                                                      w'^2v'
                                                                               w'^2u'
                                                                                       u'^2w'
                       .624
 26.00 224.99
                2.036
                                   .580
                                            .307
                                                     .675
                                                               .431
                                                                       .709
                                                                               1.060
                                                                                        .654
                6.419
 24.00 224.99
                           .669
                                   1.455
                                            1.621
                                                      1.059
                                                                .367
                                                                       1.049
                                                                                2.209
                                                                                        1.353
```

```
2.267 1.726 .925 .868 2.990
6.311 4.665 1.347 2.158 5.814
            10.805
26.326
                                                                                   2.687
22.00 224.99
                         .950
                                 1.760
                      2.649
                                                                                   3.248
                                 3.384
20.00 224.99
                                                                    3.708
                                                                           9.071
                                                                                   4.559
                      3.981
18.00 224.99
            44.906
                                 3.716 11.236
                                                 7.868
                                                            2.219
                                                                         12.121
                                3.598 19.708 13.475
6.541 19.062 17.207
             71.961
                        7.448
                                                            2.624
                                                                    4.242
                                                                                   7.385
15.99 224.99
                                                                    6.915 16.098
                                                                                   6.046
                                                            1.073
              63.103
                       13.968
13.99 224.99
                                4.177
             61.213 14.681
                                       18.286 18.125
                                                            .526
                                                                    6.971 12.562
                                                                                   6.871
11.99 224.99
                                                                         9.724
                                                            1.764
                                                                    6.695
                                                                                   2.896
                                5.400 7.348 13.563
 9.99 224.99
            30.598 14.387
            19.353
                     13.860
                                         .755 9.210
6.089 3.871
                                                            .296
                                                                    4.509
                                                                           7.989
                                                                                   5.047
 7.99 224.99
                                 1.856
                                 5.934
                                                            .908
                                                                    2.152
                                                                         2.067
                                                                                   -1.692
 5.99 224.99
              24.377
                        8.534
                                                                                   .021
                                                                    3.278
                                                                           -.562
                                5.181 -3.297
                                                  1.010
                                                            -.373
 3.98 224.99
            10.643
                       5.631
                                4.476
                     6.161
                                        -5.260
-.170
             6.313
                                                 -2.772
                                                            .371
                                                                    .778
                                                                          -1.735
                                                                                    . 921
 2.01 224.99
                                                                    2.862 -2.406
                                                                                   -3.484
                                                 -.672
                                                            1.060
  .00 224.99
               3.772
                                 3.847
C FILENAME= H904A001.E 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
C
 8 : No. of data points
                                                         v'^2w' w'^2v' w'^2u' u'^2w'
сy
               u'^3
                        v'^3
                                w'^3
                                                v'^2u'
                                         u'^2v'
       ×
                                                .000
                                                         .003
                                                                  .005
                        .004
                                .010
                                        .002
               .002
                                                                           .001
                                                                                   .003
26.00
      1.50
                                                                    .002
                                                                                    .001
                         .001
                                  .008
24.00
       1.50
               -.003
                                           .002
                                                   -.001
                                                             .002
                                                                           -.002
      1.50
                         .002
                                           .004
                                  .006
                                                 -.003
                                                            .002
                                                                    .001
                                                                           -.003
                                                                                    .006
               -.004
22.00
                                                 -.004
                                                            .002
                                                                    .005
                                                                           -.003
                                                                                    005
                         .004
                                 .010
      1.50
               -.005
                                          .002
20.00
      1.50
                                         .011 -.011
.177 -.346
                                                                    .014
                                                                                    .000
                                  .003
                                                                           -.010
18.00
               -.052
                        -.008
                                                            .001
                               7.318
                                                                    .194
                                                                           .073
                                                                                    -164
      1.50
1.50
                                                           1.135
               -.187
                        1.777
16.00
                     87.021 122.296 37.476 44.052 30.608 17.284 11.561
                                                                                   22.721
              47.760
15.01
                                                           .629
                     19.084 -56.151 -10.885 -1.843
                                                                   1.372
                                                                           -.495
                                                                                   -4.107
14.01 1.50
             -22.662
C FILENAME= H904A010.E 2
C
C H2 FLAME; d=9.45, d=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm
 LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
С
C D090894
 8 : No. of data points
                                                          v'^2w' w'^2v' w'^2u'
             u'^3
                                                 v'^2u'
-.006
                                                                                  u'^2w'
                                w'^3
                        v'^3
                                         u'^2v'
Су
       ×
                        .004
                                         .002
                                                                          -.003
                                                          .002
                                                                  .005
                                                                                  .000
26.00 10.00
                                 .006
               -.009
                                           .006
                                                  -.017
                                                           -.006
                                                                     .007
                                                                           -.006
                                                                                   -.004
24.00 10.00
               -.034
                        -.011
                                  .013
                                                 -.136
                                         .028
                                                          -.034
                         .070
22.00 10.00
                                                                    .029
                                                                           -.084
                                                                                   -.040
               -.191
                                 -.038
                                                                           -.312
                       1.687
                                1.530
                                                   .346
                                                                    .336
                                                                                    .476
20.00 10.00
                                          .295
                                                            .814
               .293
                                                           41.109 24.155 14.490
                                                                                  17,706
18.00 10.00
              56.456
                     86.368
                              62.111 39.947
                                                 45.382
             -33.263
                               -37.281
-45.635
                                                           2.167
                                                                  -8.660
                                                                          -5.029
                                                                                   -5.941
16.00 10.00
                       9.733
                                        -25.004
                                                 -16.959
                     -13.660
                                        -23.058 -18.064
                                                           -8.832 -16.744 -11.494
                                                                                   -3.107
15.01 10.00
             -38.814
            -28.933 -18.602 -31.308 -20.766 -19.040
14.00 10.00
                                                           -4.176 -8.800 -4.879
                                                                                  -3.905
C FILENAME= H904A025.E 2
C
C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
 7 : No. of data points
С
                                       u'^2v'
             u'^3
                       v'^3
                                                                 w'^2v' w'^2u' u'^2w'
2.314 .081 .256
                                        u'^2v' v'^2u'
1.580 .792
                                 w'^3
                                                          v'^2w'
       x
                                                          1.790
               1.337
                        4.848
                                 1.869
26.00 25.00
                              30.772 26.391 32.207 21.552 21.005 16.950
24.00 25.00
             37.077
                       56.721
                                                                                  11.670
                                                                   19.177 18.620
1.356 -4.018
                              41.047 42.701
-2.579 13.348
                      94.810
                                                 48.308
                                                           21.473 19.177
                                                                                  15.777
             67.380
22.00 25.00
                                               17.143
                                                                                   4.575
              15.244
                       53.678
                                                           9.521
20.00 25.00
                      17.598
                                                           -4.780 -5.423 -6.073
             -23.373
                              -13.758 -11.960 -11.977
                                                                                   -4.374
18.00 25.00
                                                                         -6.800
                                                                 -9.582
-1.629
                               -16.906 -18.931 -22.473
                                                          -5.167
                                                                                  -4.369
15.99 25.00
             -25.913
                      -6.765
                                                                          -7.692
                                                  -7.538
                                                          -1.614
                                                                                  -6.558
13.99 25.00
            -25.144
                      -4.769
                              -10.801
                                         4.431
C FILENAME= H904A050.E 2
C H2 FLAME; d=9.45, d=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
C 11 : No. of data points
               u'^3
                        v1^3
                                 w'^3
                                         u'^2v'
                                                 v'^2u'
                                                          v'^2w' w'^2v' w'^2u'
       x
                                                         6.739 5.253 4.758
                                                                                   2.182
              21.025
                       37.468
                               3.658
                                        10.320
                                                 12.806
 26.00 50.00
                                                          2.730
             9.394
                                -.027
                                         1.702
                                                  -.090
                                                                    2.298
                                                                            .482
                                                                                   -1.257
 24.00 50.00
                       25.371
                                                                    .306 -2.261
                       12.221
                                -4.962
                                         -2.538
                                                  -4.737
                                                            1.233
                                                                                  -2.764
 22.00 50.00
               5.222
                                                           -4.468 -2.054 -1.767
                                         -2.904
                                                  -7.280
                                                                                  -1.628
                               -4.188
 20.00 50.00
              -5.037
                        2.970
```

```
-2.767
 18.00 50.00
                                                                            -2.735 -2.317
-3.665 -1.115
                  -5.709
                               2.050
                                          -7.401
                                                                 -8,440
                                                                                                 -4.538
                                                                -6.552
                                                                                                           -2 480
 17.00 50.00 -3.331 2.765
                                        -5.623
                                                      -.430
                                                                                                 -2.353
                                                                                                            -1.092
 16.01 50.00
                                .593 -10.185
                   -8.717
                                                       1.844
                                                                 -9.456 -2.203 -1.279 -3.145
                                                                                                           -2.675
 14.99 50.00
                  -16.327
                                -.389
                                          -8.967
                                                      5.318
                                                                -3.767 -1.138 -1.331
                                                                                                 -2.668
                                                                                                           -4.981
                              1.204
 14.01 50.00 -9.746
                                          -5.939
                                                      4.580
                                                                 -5.277
                                                                            -3.366
                                                                                        .192
                                                                                                 -1.204
                                                                                                           -5.179
                                                                -3.097 -1.171
 13.00 50.00 -6.597
                               2.290
                                          -8.426
                                                     6.442
                                                                                        1.019
                                                                                                 -2.374
                                                                                                           -4 111
 12.00 50.00
                    -.259
                               3.458 -11.245 5.269 -1.640 -4.263
                                                                                        .398 -3.027 -5.386
C FILENAME= H904A075.E 2
C H2 FLAME; d=9.45, d=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
C 15 : No. of data points
Су
          x u'^3
                              v'^3
                                          w'^3
                                                    u'^2v'
                                                                v'^2u'
                                                                            v'^2w'
                                                                                               w'^2u'
                                                                                      w'^2v'
                                                                                                           11 1 ^ 2 w !
                     .373
 26.00 75.00
                                                     -.103 -2.065
                               6.618 -1.314
                                                                             -.597
                                                                                      -1.936
                                                                                                 -.466
                                                                                                           -1.314
                            -.998 -4.176
.545 -3.491
 24.00 75.00 -2.670
22.00 75.00 -.549
                                                       .471 -5.885
                                                                             -3.170 -3.087
                                                                                                 -1.330
                                                                                                           -1.587
                                                      -.307 -3.042 -1.723 -2.585 -.417
.132 .708 -4.920 -1.883 -2.363
.777 -2.057 -1.068 -2.043 .642
 22.00 75.00 -.549 .545 -3.491
20.00 75.00 -6.023 -3.945 -2.064
                                                                                                            .470
                                                                                                            - .092
 19.00 75.00 -2.250 1.254 -3.341
                                                                                                            -.797

    18.01
    75.00
    -3.151
    -.808
    -2.671
    .792
    -.961
    -1.930
    -1.436
    -1.364
    -1.842

    17.00
    75.00
    -2.196
    .848
    -3.514
    1.069
    -.970
    -.587
    -.988
    .051
    -1.536

    16.00
    75.00
    -.932
    .250
    -4.067
    .013
    .479
    -1.095
    -2.097
    -.714
    -1.185

    15.01
    75.00
    -.151
    1.867
    -3.466
    1.006
    1.343
    -1.415
    -1.349
    .462
    -.689

    14.01
    75.00
    -1.981
    1.302
    -4.178
    1.808
    1.652
    -1.410
    -.358
    .083
    -2.204

    12.01
    75.02
    2.709
    4.388
    -5.162
    2.942
    4.580
    739
    1.847
    1.255
    -.264

                                         -5.162
-2.774
                   3.799
                              4.388 5.260
                                                     2.942 4.580
2.850 4.409
6.829 11.762
                                                                             .739
                                                                                      1.847 1.255
                                                                                                            -.264
 12.00 75.00 12.068
                                                                                       2.920
                                                                             1.940
                                                                                                  3.409
                                                                                                           -1.330
                                                                             3.529
                              9.612
                                         -6.491
 11.01 75.00 22.515
                                                                                       6.108
                                                                                                  7.994
                                                                                                           -1.430
                              15.632 -7.920 17.310 18.623
42.803 -41.544 63.525 72.571
                                                                            4.399 12.292 39.071
   9.99 75.00
                   88.565
  9.01 75.00 88.565
9.10 75.00 312.236
                                                                                                            . 853
                                                                             2.144 41.222 87.004 -18.839
C FILENAME= H904A150.E 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm
   LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
  D090894
                                        w'^3 u'^2v' v'^2u' v'^2w' w'^2v' w'^2u' u'^2w'
-.369 .454 .176 -.220 -.155 .798 - ^77
  6 : No. of data points
Су
         x u'^3 v'^3
                            -.017
.112
 26.00 150.00
                    1.466
 24.00 150.00
                     .801
                                                                             .147
                   1.077
                                                       .435
 22.00 150.00
                                 .250
                                           .324
                                                                              .078
                                                                 .336
                                                                                        .220
                                                                                                             .338
                                                                                                   .463

    18.00 150.00
    19.978
    2.796
    1.446
    3.584
    4.292

    16.00 150.00
    50.593
    5.520
    -1.398
    13.541
    10.015

    13.99 150.00
    131.633
    24.685
    -3.438
    39.477
    30.591

                                                                4.292
                                                                              .631
                                                                                     1.455
                                                                                                 4.615
                                                                                                             .208
                                                                10.015 1.132
                                                                                       4.317
                                                                                                 11.558
                                                                                                            1.191
                                                                             .773
                                                                                       9.948
                                                                                                 22.168
                                                                                                          -7.519
C FILENAME= H904A225.E 2
C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm
C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C D090894
C 10 : No. of data points
         x u'^3
                             v'^3
                                         w'^3
                                                   u'^2v'
                                                              v'^2u' v'^2w' w'^2v' w'^2u' u'^2w'
 26.00 224.99
                                       -.095 -.215
-.008 5.083
.872 4.561
                                                                                     .775
                   4.670
                                .982
                                                                         .690
                                                                 .666
                                                                                               1.909 .045
 24.00 224.99
                 23.052
                              2.560
                                                                  3.948
                                                                              .793
                                                                                        1.936
                                                                                                  5.454
                                                                                                            1.599
                20.261
                                                                         1.325
 22.00 224.99
                                                                                     1.690
                                                                                                  3.801
                            2.947
                                                    4.561
                                                                3.967
                                                                                                            .402
                           6.714 -.067 12.228 9.785
11.957 -1.384 11.728 12.351
13.479 -2.712 7.300 11.342
 20.00 224.99
                   43.355
                                                                9.785 1.021 2.428
                                                                                                  7.914 -.319
                41.803
 18.00 224.99
                                                                           1.346
                                                                             1.346 3.423
.405 4.840
                                                                                                  6.735
                                                                                                            -.839
 15.99 224.99
                 26.213 13.479 -2.712
                                                                                                  8.233 -1.768
                            11.733
10.173
                                         -.465
-1.327
 13.99 224.99
                   15.892
                                                     5.236
                                                                8.511
                                                                              .096 2.861
                                                                                                  5.615
                                                                                                           3.540
 11.99 224.99
                   34.894
                                                                           .060 3.571
-1.385 3.067
                                                      9.680
                                                                10.438
                                                                                                  5.945
                                                                                                            1.188
                                          -.766 3.773
                                                               5.817
 10.00 224.99
                  11.088
                              8.105
                                                                                                 1.866 3.008
1.777 4.672
  8.00 224.99
                  10.024
                              4.208 -4.123 1.280
                                                                                     2.553
                                                                  .678
                                                                             .099
C FILENEME= H904AAX.J 2
   H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; y=0 mm
   LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894
C 22 : No. of data points
         x u'^3 v'^3
Су
                                          w'^3
                                                    u'^2v'
                                                               v'^2u'
                                                                            v'^2w' w'^2v'
                                                                                                w'^2u'
                                                                                                           u'^2w'
   .00 1.50 -96.780 -15.799
                                          5.647
                                                    -14.518
                                                               -59.957
                                                                         3.293
                                                                                     .294
                                                                                                -9.571
                                                                                                            3.772
```

```
1.838 -5.289 -17.162
                       -22.548
   .00 10.00 -126.950
                                  2.528
                                          -18.440 -66.413
   .00 20.00 -263.847
                       -75.136
                                22.372 -59.740 -184.356
                                                             35.293 -21.457 -40.347
                                                             111.003 -17.317 -302.969 225.222
                                271.859 -435.568 -1080.690
   .00 30.00 -2372.275 -255.725
   .00 40.01 -3424.759
                      -255.961
                                 82.782 -372.150 -1077.115
                                                              84.062
                                                                      42.975 -505.530
                                                                                      362.229
                                                              57.280 -43.838 -567.125
                                -72.670 -240.753 -441.104
   .00 50.00 -584.645
                       -34.839
                                                   179.685
   .00 60.01
              735.500
                         34.866 -257.312
                                          33.931
                                                              39.390
                                                                      9.474 -321.682 -27.680
                                                    300.507
                                                                     -15.137 -279.047 -98.514
                       156.672 -298.232
                                          83.900
                                                              22.463
   .00 70.00
              926.892
                                 -64.024
                                            -.060
                                                   138.876
                                                              32.352
                                                                      -2.082 -34.209
                                                                                       14.190
   .00 80.00
              405.467
                         43.339
                                                    98.791
                                                             -19.290 -22.307 -38.885
                                                                                       15.245
                                           -3.266
                         51.235
                                -32.551
   .00 90.00
              219.090
                                                                      -1.171 -52.330
                                                                                      -3 251
   .00 100.00
              122.708
                        9.264
                                -10.592
                                          16.593
                                                   66.380
                                                             -23.160
                        1.838
                                          30.987
                                                   22.578
11.334
                                                                       4.413 -39.521 -31.580
               39.755
                                -14.223
                                                              -9.707
   .00 110.00
                                                              -7.567
                                                                      -2.461 -39.861 -18.141
   .00 120.00
               10.716
                         3.987
                                -27.493
                                           -2.284
                                                                      1.216 -17.454 -17.089
   .00 130.00
               35.163
                        14.961
                                -13.017
                                          18.005
                                                    4.127
                                                              2.351
                       7.401
                                                                       -.001 -10.957
                                                  2.515
                                                             1.662
                                                                                         .899
   .00 140.00
              -13.689
                                -5.756
                                            -.666
                                                                .990
   .00 150.01
                          .077
                                                      3.852
                                                                      -1.904 -13.581
                                                                                       -2.605
              -14.053
                                   3.621
                                            1.364
                                                    1.245
                                11.550
                                           2.003
                                                             1.384
                                                                      5.418
                                                                              -5.086 -9.912
   .00 160.00
               11.102
                         1.254
                                                    5.367
  .00 170.01
                         7.538
                                  25.172
                                            5.765
                                                              6.549
                                                                       2.424 -2.985
                                                                                       -5.068
               30.958
                                                   1.862
                3.659
                          .445
                                 10.637
                                           -2.078
                                                             -1.034
                                                                       -1.283 -10.169
                                                                                       -7.494
   .00 180.00
                                                                        .044 -6.661
                                                                                       -1.660
   .00 190.01
                6.798
                          -.692
                                  8.668
                                            .151
                                                              1.762
                          .934
                                                              -1.709
                                                                        -.296 -7.326
  .00 200.01
                4.588
                                  15.714
                                            2.265
                                                     -1.008
                                                                        . 638
                                                                              -2.803
                                                                                       -1.357
                                                    2.296
                                                              .939
  .00 224.99
                6.114
                           .331
                                  19.360
                                             .644
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm
C 10 : No. of data points
            T SIGt'
Су
        x
  4.5 1.5 1456 91
       1.5 1645 193
  5.0
       1.5 1603 483
 5.5
  5.75 1.5 1389 624
       1.5 1123 654
  6.0
  6.25 1.5 937 633
       1.5 691 525
 6.5
 7.0
       1.5 450 313
 7.6
       1.5
           329 74
       1.5 315 41
 8.8
C FILENAME= H904A010.T
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm
C D062394
С
   8 : No. of data points
С
            T SIGt'
       х
 У
 6.0
       10 1615 146
       10 1716 171
 6.5
 7.0
      10 1827 253
           1776 403
 8.2
       10
       10 1525 617
 8.8
           959 650
 9.6
      10
           623 471
 10.4
       10
 11.2
       10
           400 221
C FILENAME= H904A025.T
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm
C D062394
C 13 : No. of data points
Су
            T SIGt'
        х
 8.2 25 1580 116
       25 1595 114
 8.8
       25 1633 141
 9.6
       25 1677 150
 10.4
       25 1761 209
 11.2
 12.0
       25 1776 364
       25 1654 558
 12.8
 13.4
       25 1460 641
       25 1618 480
 14.0
           814 618
 14.7
       25
```

-6.330

```
25
 15.5
             598 473
 16.5
        25
             407 235
        25
             340 88
 17.7
C FILENAME= H904A050.T
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm
C D062394
C 16 : No. of data points
Су
              T SIGt'
        x
  9.6
        50 1528 349
 10.4
        50 1664 223
 11.2
        50 1546 425
 12.0
        50 1485 480
 12.8
        50
           1670 305
 13.4
        50
            1615 340
 14.0
        50 1365 595
 14.7
        50 1631 369
 15.5
        50
           1446 578
 16.5
        50
           1083 641
 17.7
        50
            902 625
 19.0
        50
             778 560
 20.5
        50
             587 440
             532 378
 22.0
        50
 23.5
        50
             443 282
 25.0
        50
             388 180
C FILENAME= H904A075.T
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm
C D062394
C 19 : No. of data points
C
             T SIGt'
  У
        x
  8.8
       75 1573 279
  9.6
       75 1604 295
 10.4
        75
           1605 294
        75 1578 334
 11.2
 12.0
       75 1583 407
 12.8
        75
            1534 420
 13.4
       75
           1482 469
 14.0
       75
          1418 521
       75
 14.7
           1376 530
       75
 15.5
           1309 536
 16.5
       75
          1277 567
       75
           1191 566
 17.7
 19.0
       75
            1421 390
 20.5
       75
           1012 559
 22.0
       75
             884 543
 23.5
       75
             762 495
 25.0
       75
             669 439
26.5
       75
             553 350
28.0
       75
             535 331
C FILENAME= H904A150.T
C H2 FLAME; d=9.45, d=10.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm
C D062394
C 15 : No. of data points
             T SIGt'
 0.0
      150 1604 98
 1.3
       150 1619 104
 2.7
       150 1635 117
 4.5
       150 1637 119
 6.0
       150 1637 137
       150 1646 152
 7.6
 9.6
       150 1630 218
11.2
       150 1650 185
13.4
       150 1659 214
```

```
150 1606 373
150 1719 269
14.7
 16.5
 19.0
        150 1661 309
        150 1420 557
 22.0
 25.0
        150 1166 594
       150 1005 555
28.0
C FILENAME= H904A225.T
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm
C D062394
C 15 : No. of data points
Су
         x T SIGt'
 0.0
       225 1629 121
        225 1636 177
  1.3
  2.7
        225 1669 116
        225 1680 130
  4.5
        225 1664 127
225 1666 122
  6.0
  7.6
  9.6
        225 1669 166
        225 1694 210
 12.0
        225 1692 181
 13.4
        225 1676 316
 14.7
        225 1690 270
 16.5
        225 1681 376
225 1559 468
 19.0
 22.0
        225 1420 548
 25.0
 28.0 225 1257 539
```